

Figure 1. Amino acid sequence of the B4ECv3 protein

MELRVLLCWASLAAALEETLLNTKLETADLKWVTFFQVDGQWEELSG
LDEEQHSVRTYEVCVQRAPGQAHWLRTGWVPRRGAVHVVYATLRFTM
LECLSLPRAGRSCKETFTVFYYESDADTATALTPAWMENPYIKVDTV
AAEHLTRKRPGAEATGKVVNKTLLRLGPLSKAGFYLAQDQGACMALL
SLHLFYKKCAQLTVNLTRFPETVPRELVPVAGSCVVDVAVPAPGSP
SLYCREDGQWAEQPVGTGCSCAPGFEAAEGNTKCRACAQGTKPLSGE
GSCQPCPANSHTIGSAVCQCRVGYFRARTDPRGAPCTTPPSAPRS
VVSRLNGSSLHLEWSAPLES GGREDLTYALRCRECRPGGSCAPCGGD
LTFDPGPRDLVEPWVVVRGLRPDFTYTFEVTALNGVSSLATGPVPFE
PVNVTTDREVPPAVSDIRVTRSSPSSLSLAWAVPRAPSGAWLDYEVK
YHEKGAEGPSSVRFLKTSENRAELRGLKRGASYLVQVRARSEAGYGP
FGQEHHSQTQLDESEGWREQGSKRAILQIEGKPIPNPLLGLDSTRTG
HHHHHH

Figure 2. Amino acid sequence of the B4ECv3NT protein

MELRVLLCWASLAAALEETLLNTKLETADLKWVTFPQVDGQWEELSG
LDEEQHSVRTYEVCEVQRAPGQAHWLRTGWVPRRGAVHVIATLRFMT
LECLSLPRAGRSCKETFTVFYYESDADTATALTPAWMENPYIKVDTV
AAEHLTRKRPGAEATGKVNKTLRLGPLSKAGFYLAHQDQACMALL
SLHLFYKKCAQLTVNLTRFPETVPRELVPVAGSCVVDVAVPAPGPSP
SLYCREDGQWAEQPVTCGSCAPGFEEAEGNTKCRACAQGTFFKPLSGE
GSCQPCPANSHSNTIGSAVCQCRVGYFRARTDPRGAPCTTPPSAPRS
VVSRLNGSSLHLEWSAPLES GGREDLTYALRCRECRPGGSCAPCGGD
LTFDPGPRDLVEPWVVVRGLRPDFTYTFEVTALNGVSSLATGPVPFE
PVNVTTDREVPPAVSDIRVTRSSPSSLSLAWAVPRAPSGAWLDYEVK
YHEKGAEGPSSVRFLKTSENRAELRGLKRGASYLVQVRARSEAGYGP
FGQEHHSQTQLDESEGWREQGSKRAILQISSTVAAARV

Figure 3. Amino acid sequence of the B2EC protein

MAVRRDSVWKYCWGVLMLCRTAISKSIVLEPIYWNSSNSKFLP
GQGLVLYPQIGDKLDIICPKVDSKTVGQYEYYKVYMWVDKDQADR
CTIKKENTPLLNCAKPDQDIKFTIKFQEFSPNLWGLEFQKNKDY
YIISTSNGLLEGLDNQEGGVCQTRAMKILMKVGQDASSAGSTRN
KDPTRRPELEAGTNGRSSTTSPFVKPNPGSSTDGNSAGHSGNNI
LGSEVGSHHHHH

Figure 4. Amino acid sequence of the B4ECv3-FC protein

MELRVLLCWASLAAALEETLLNTKLETADLKWVTFPQVDGQWEEL
SGLDEEQHSVRTYEVCEVQRAPGQAHWLRTGWVPRRGAVHVIATL
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IKVDTVAAEHLTRKRPGAEATGKVNKTLRLGPLSKAGFYLAQD
QGACMALLSLHLFYKKCAQLTVNLTRFPETVPRELVVPVAGSCVV
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CAQGTKPLSGEGSCQPCPANSHTIGSAVCQCRVGYFRARTDP
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CRECRPGGSCAPCGGDLTFDPGPRDLVEPWVVVRGLRPDFTYTFE
VTALNGVSSLATGPVPFEPVNVTTDREVPPAVSDIRVTRSSPSSL
SLAWAVPRAPSGAWLDYEVKYHEKGAEGPSSVRFLKTSENRAELR
GLKRGASYLVQVRARSEAGYGPFGEHHSQTQLDESEGWREQDPE
PKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTC
VVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVL
TVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTL
PPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPP
VLDSGDGSFFLYSKLTVDKSRWQQGNVFSCSVMEALHNHYTQKSL
SLSPGK

Figure 5. Amino acid sequence of the B2EC-FC protein

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SCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVV
DVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLH
QDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRD
ELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG
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Fig. 6. B4EC-FC binding assay (Protein A-agarose based)

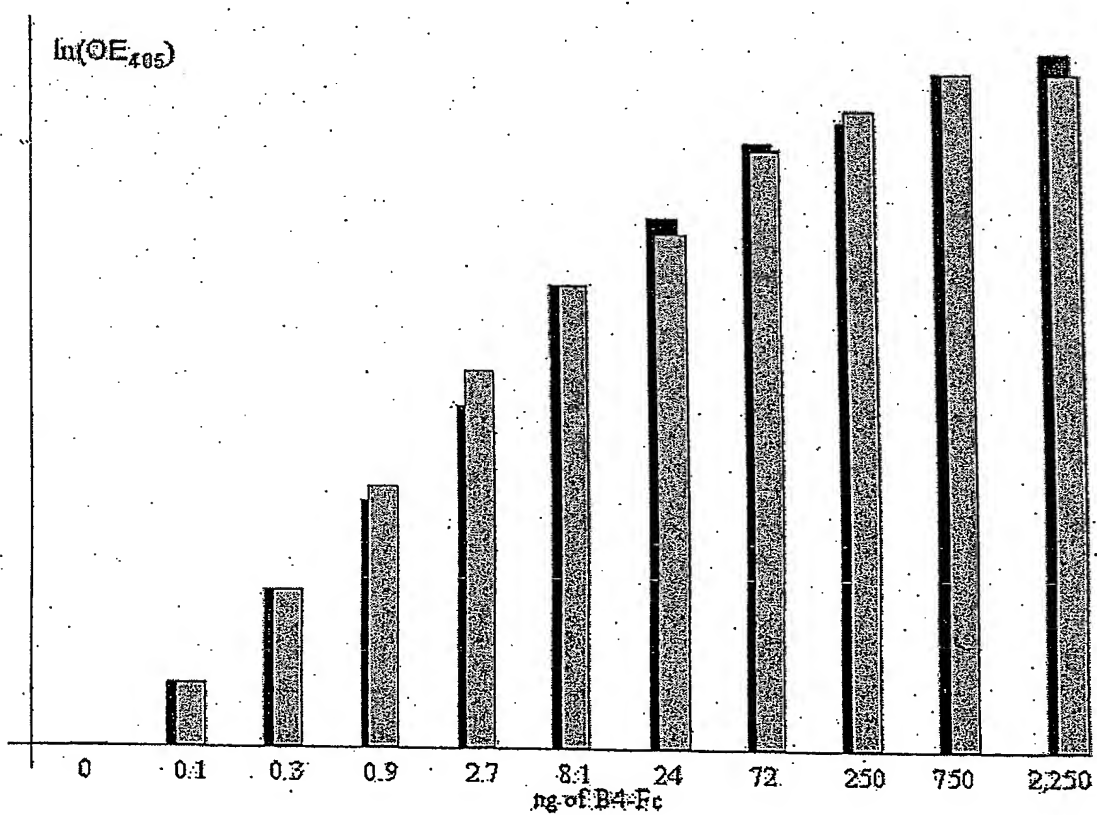


Fig. 7. B4EC-FC inhibition assay (Inhibition in solution)

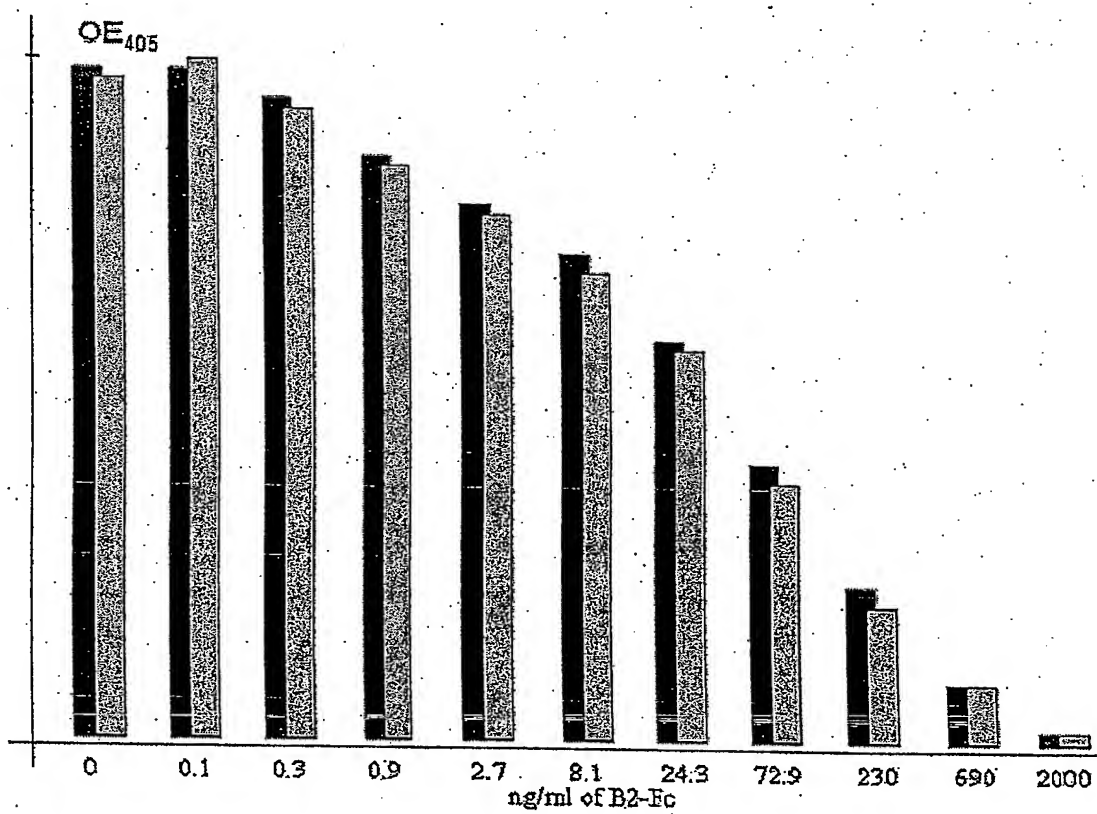


Fig. 8. B2EC-FC binding assay (Protein-A-agarose based assay)

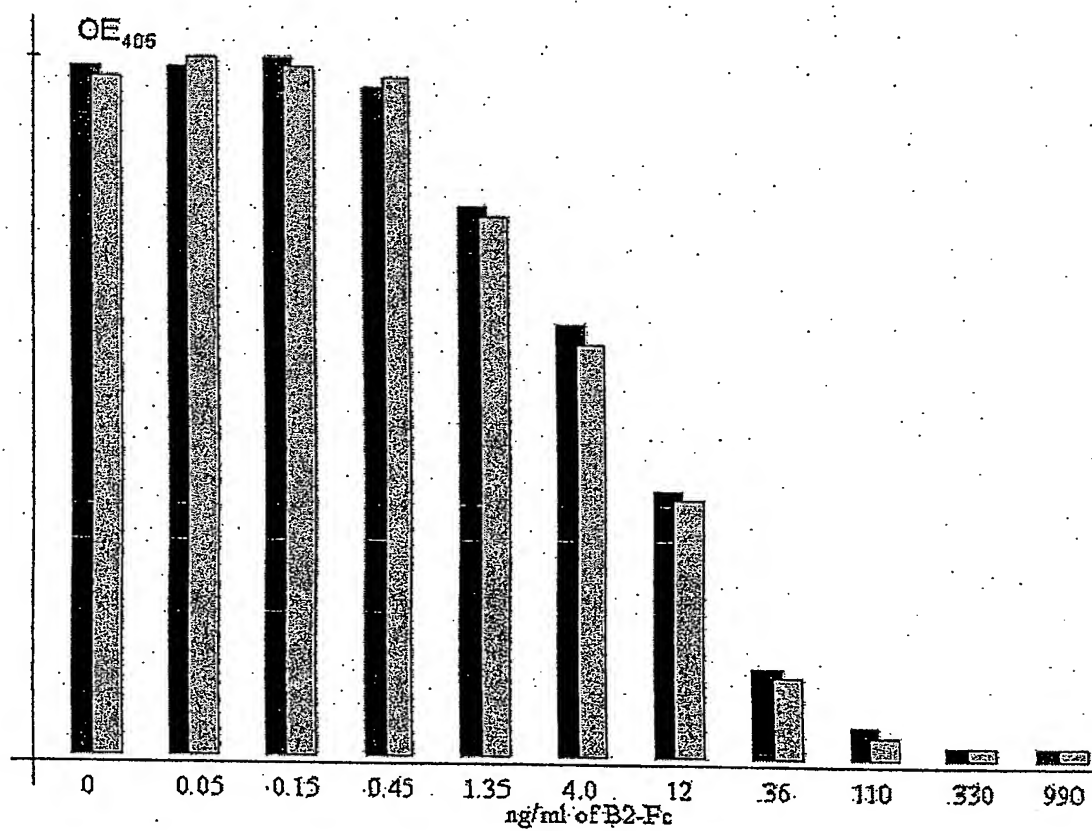


Fig. 9

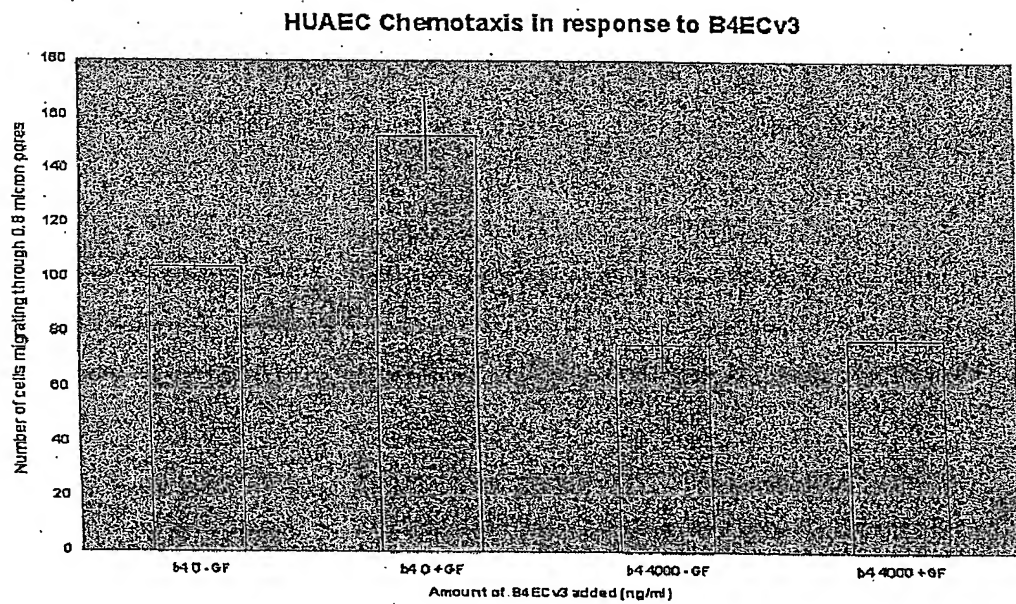


Fig. 10

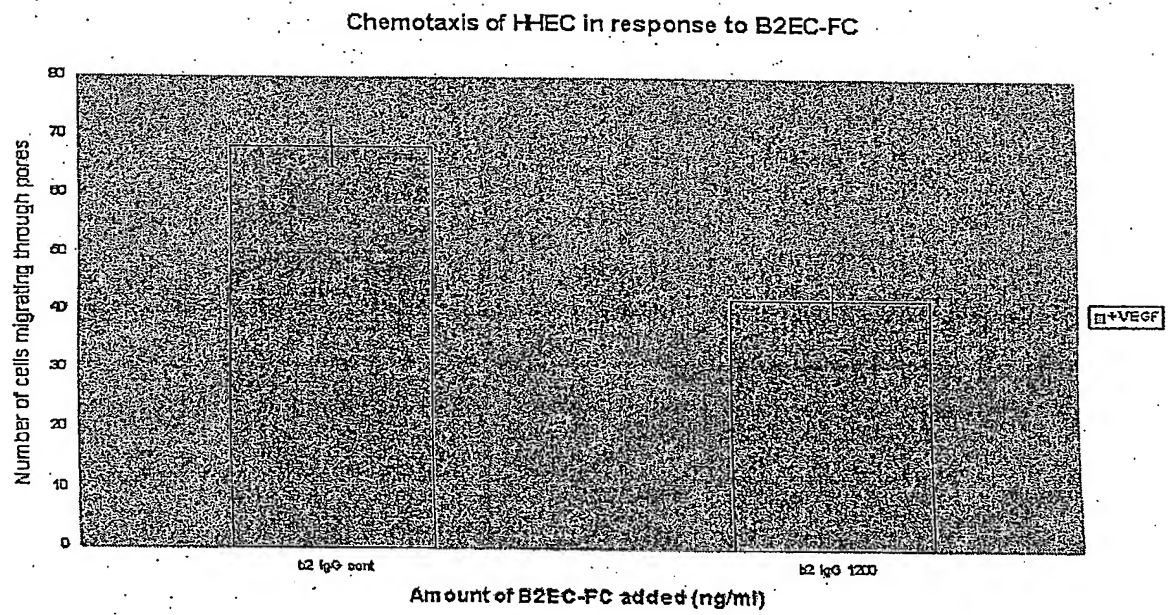


Fig. 11

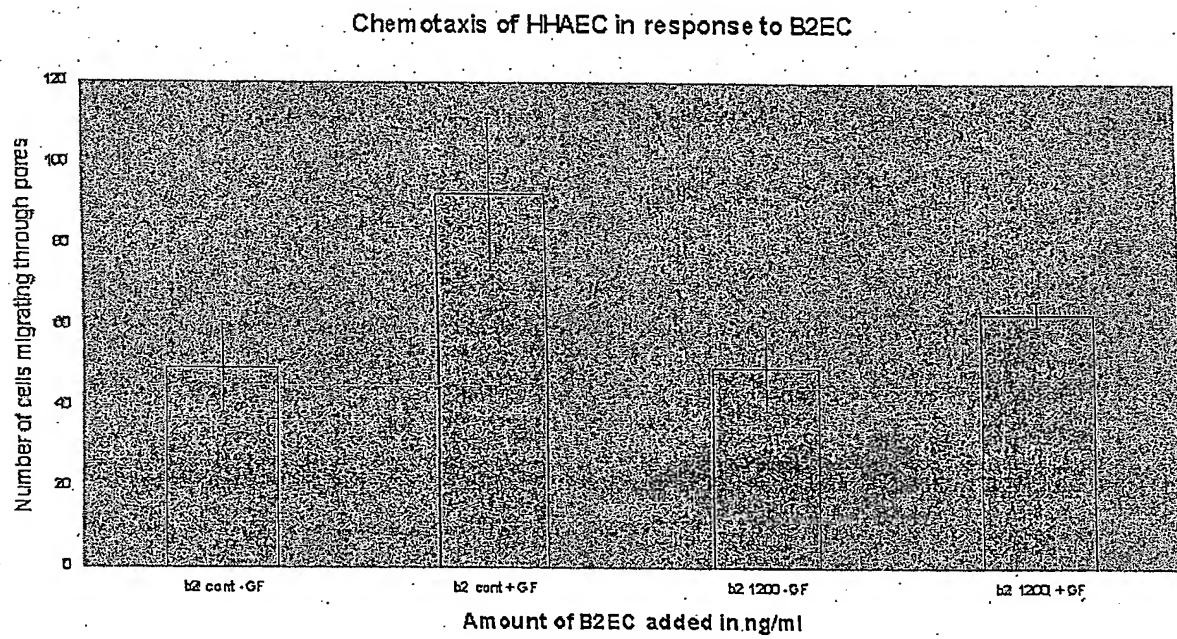


Fig. 12

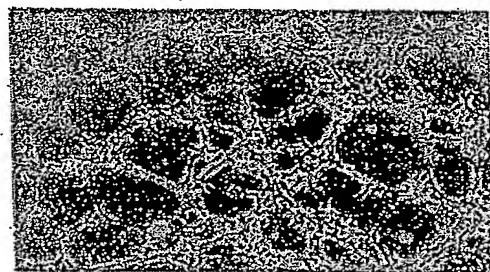
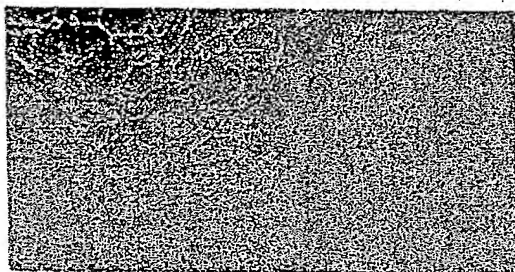
Effect of B4ECv3 on HUAEC Tubule Formation

**B4ECv3
μg/ml**

10 x magnification

20 x magnification

0



2

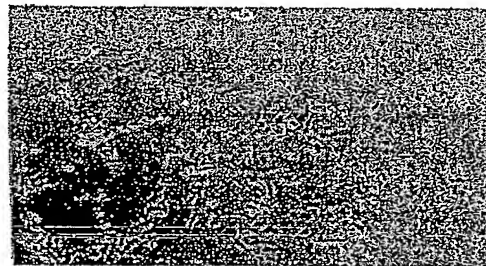
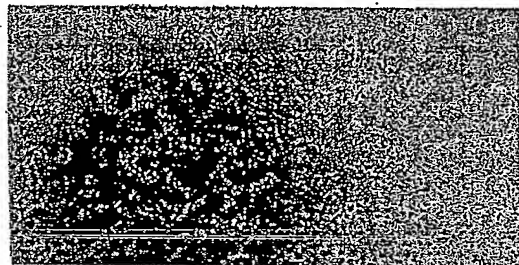
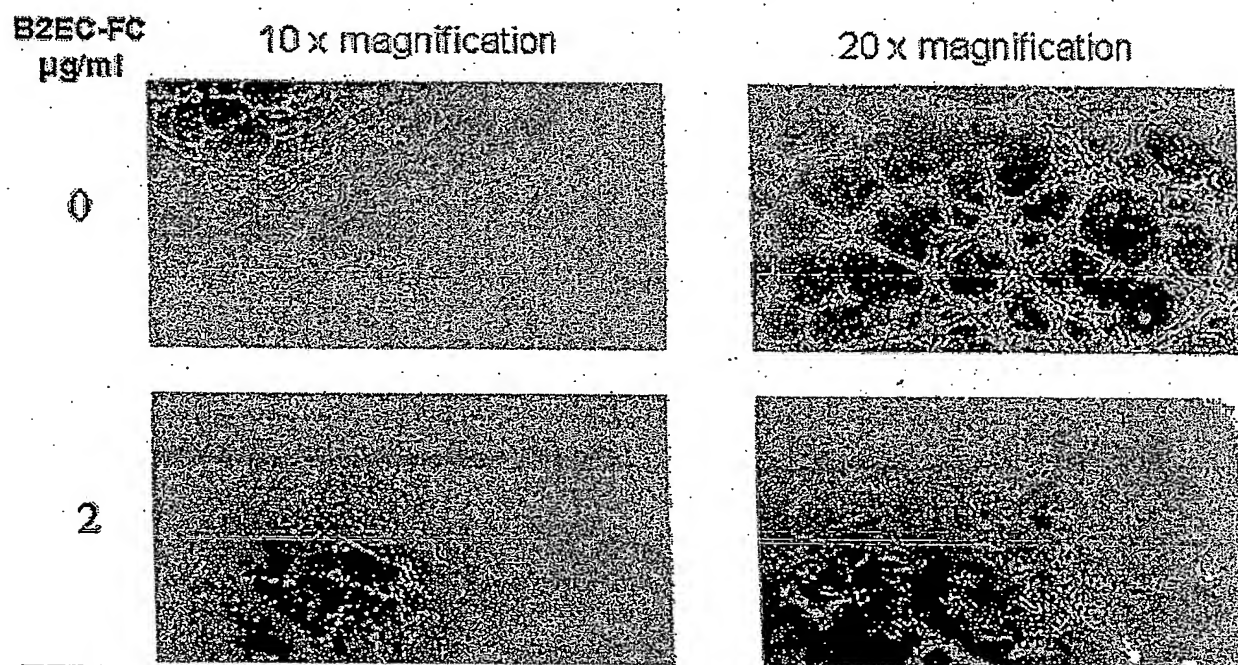


Fig. 13

Effect of B2EC-FC on HUAEC Tubule Formation



hEphrin B2 constructs

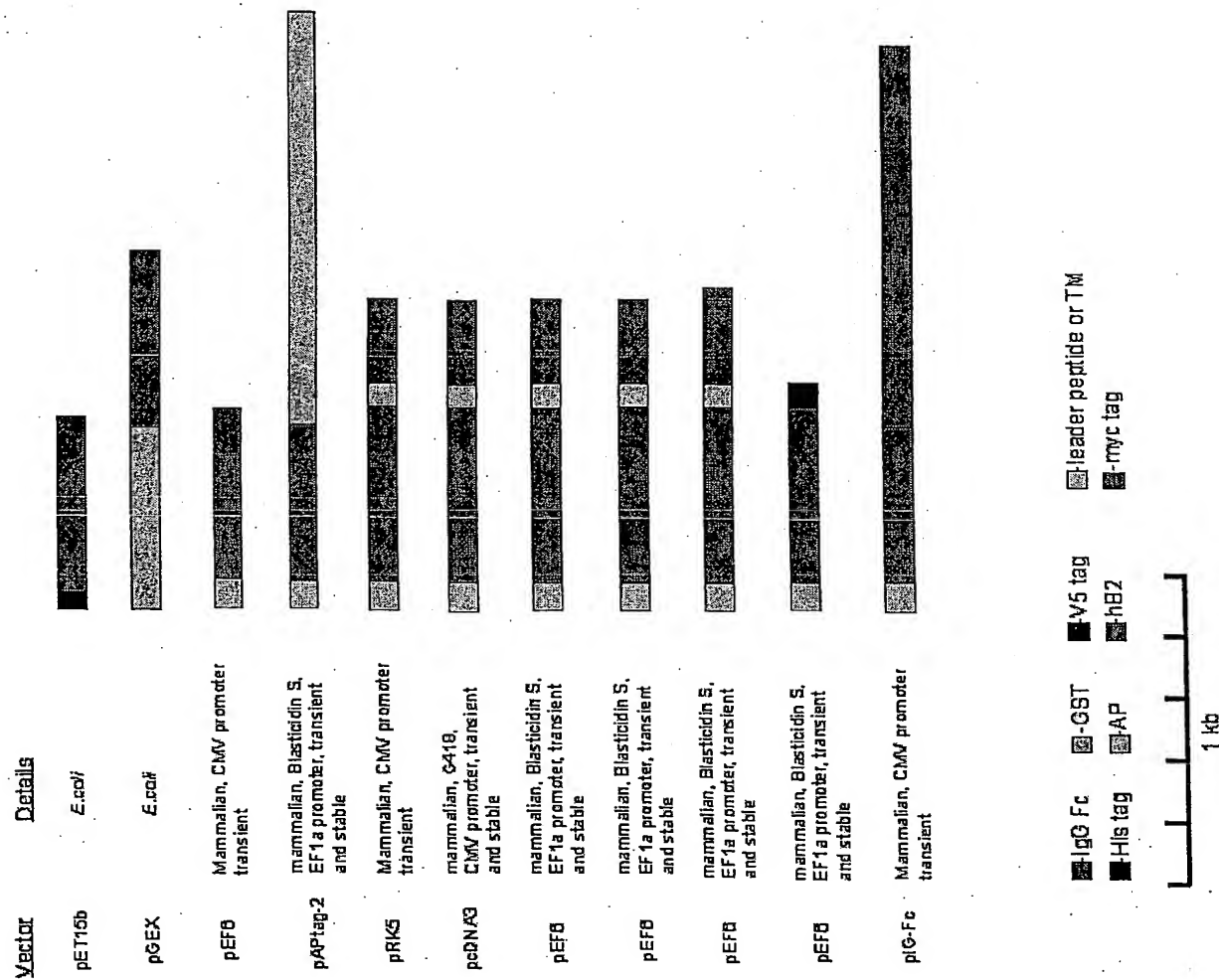
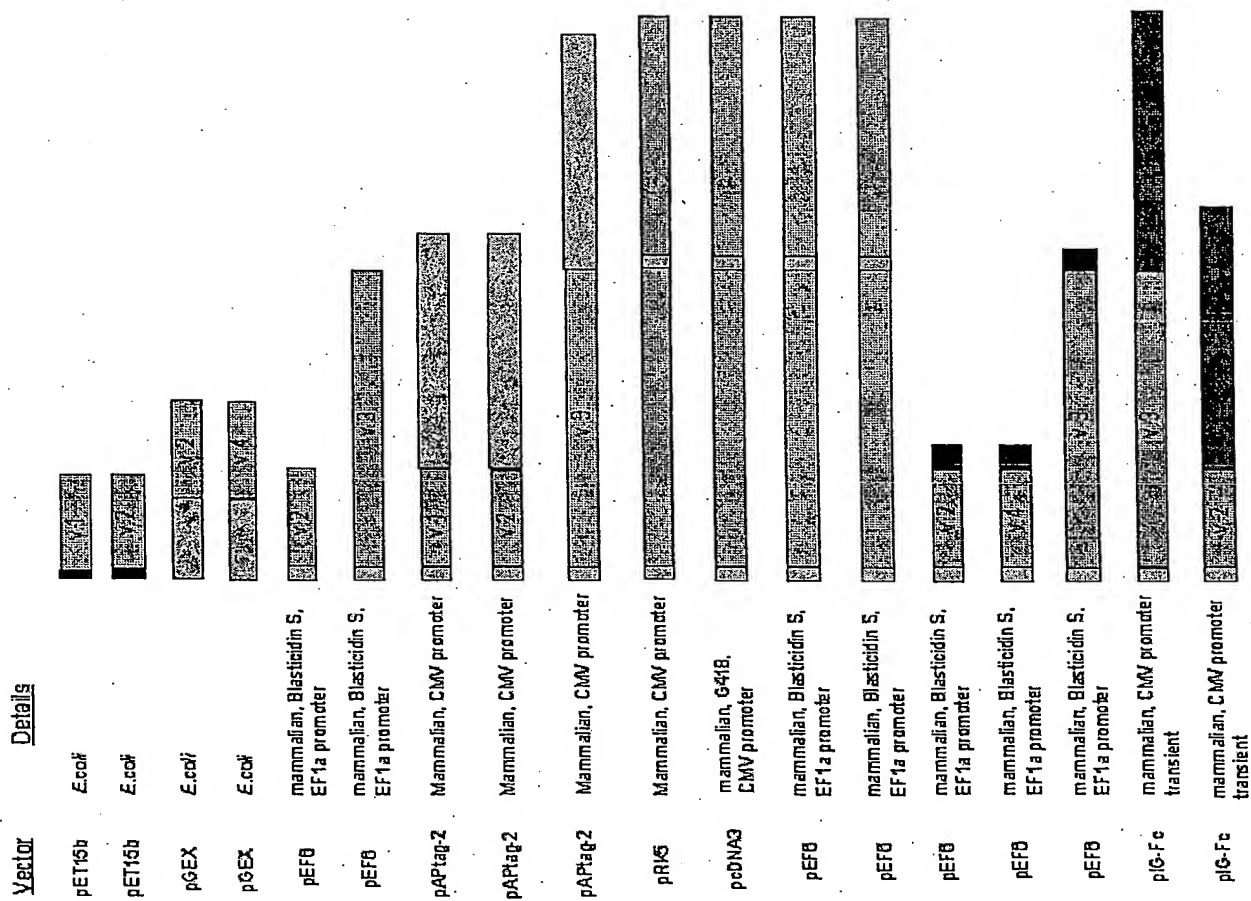


Figure 14

hEph B4 constructs



 IgG Fc tag
  V5 tag
  Leader peptide or TM
  His tag
  AP
  hB4
  myc tag

1 kb

Figure 15

Figure 16. Domain structure of the recombinant soluble EphB4EC proteins.

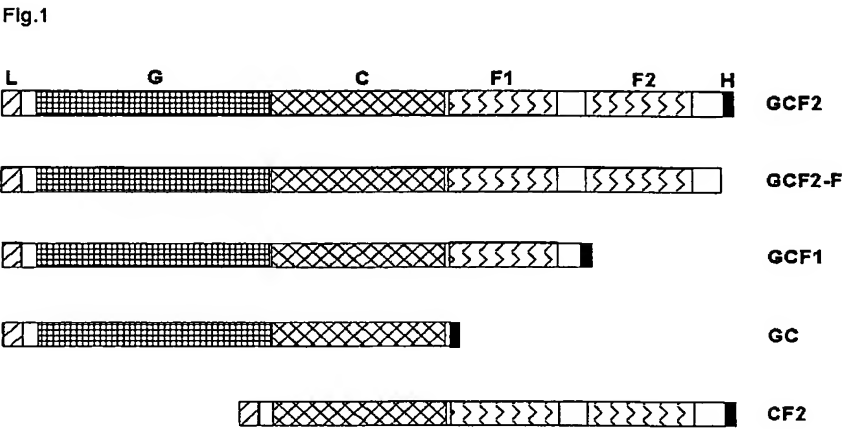


Figure 17A. Purification and ligand binding properties of the EphB4EC proteins

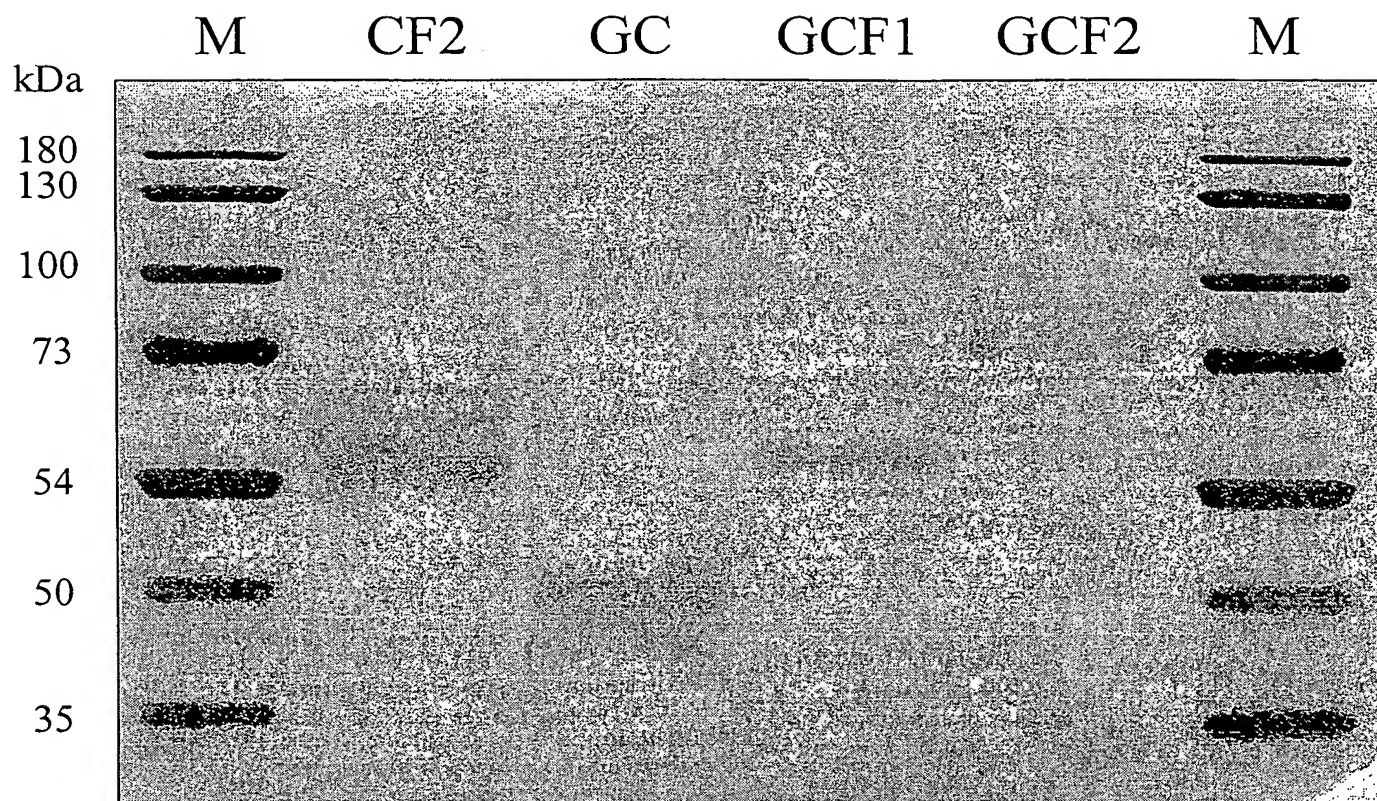


Figure 17B. Binding of Ephrin B2-AP fusion to EphB4-derived recombinant proteins immobilized on NTA-agarose beads.

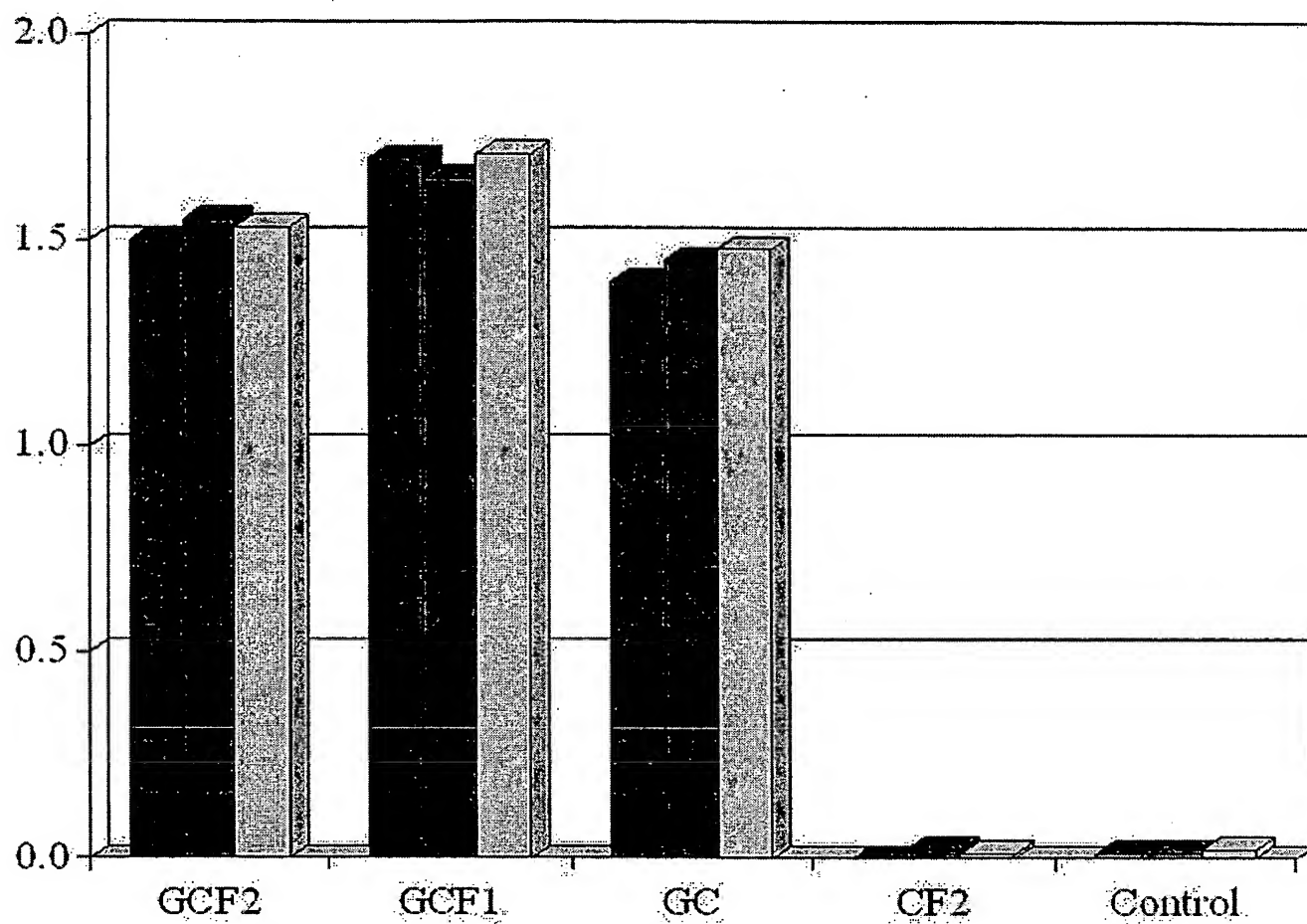
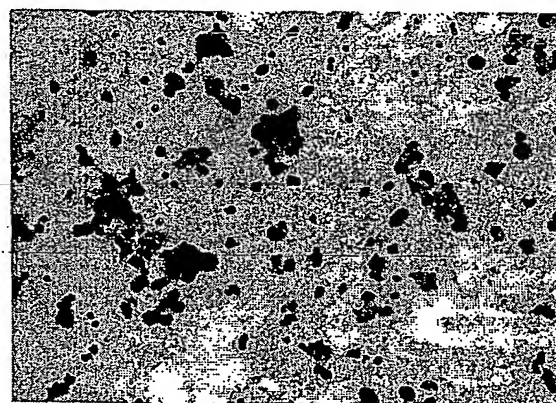
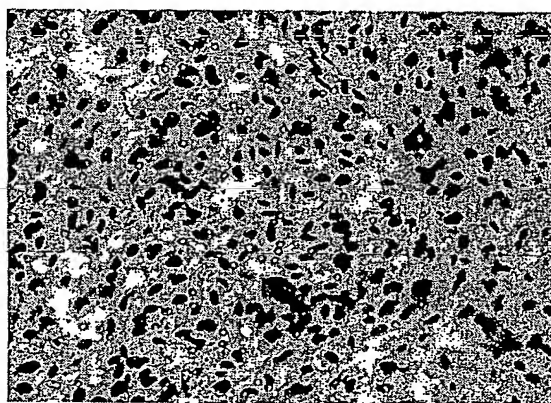
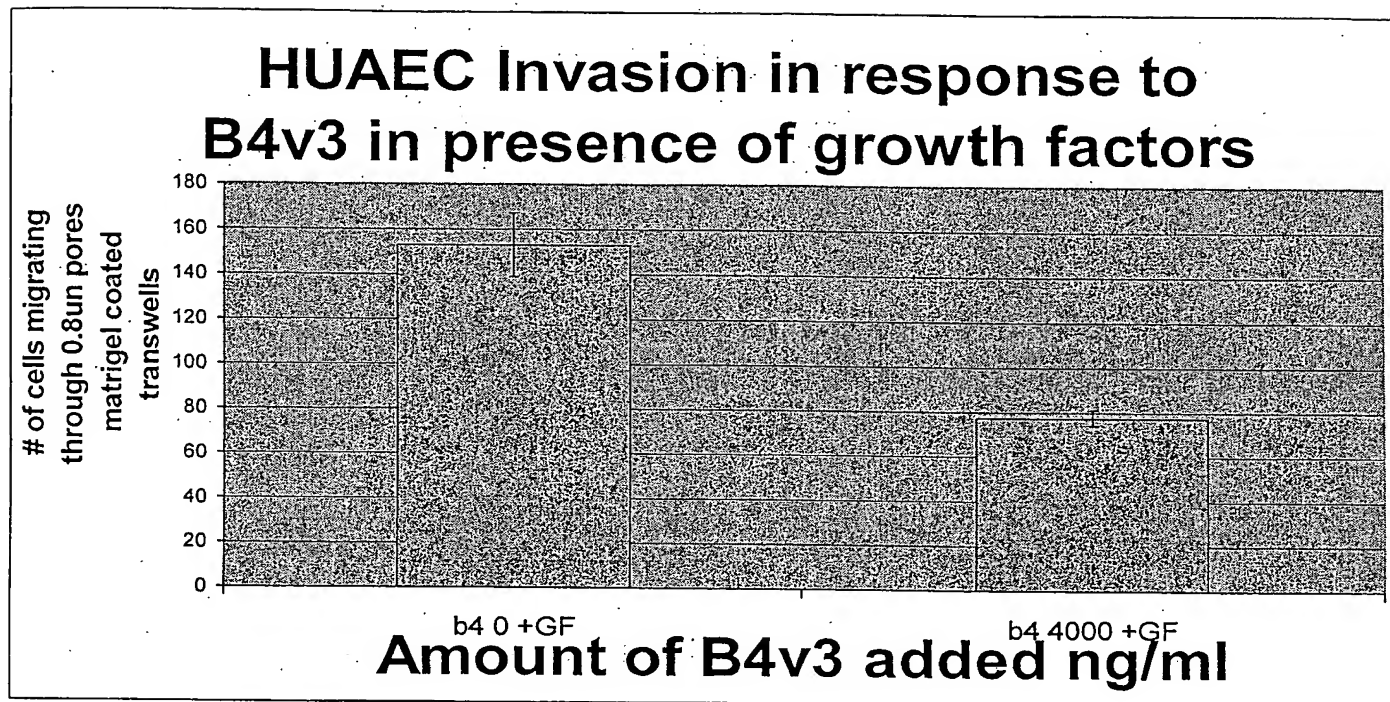


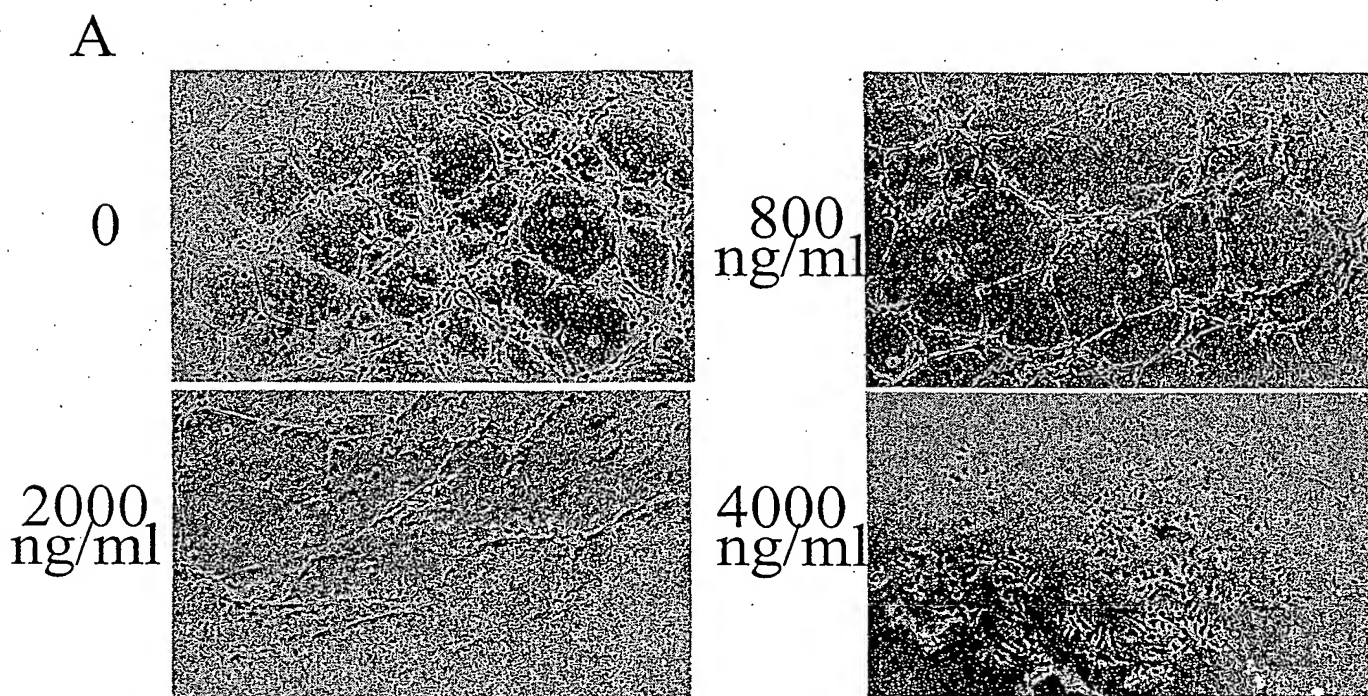
Fig. 18

B4v3 inhibits chemotaxis, In Vitro Invasion Assay

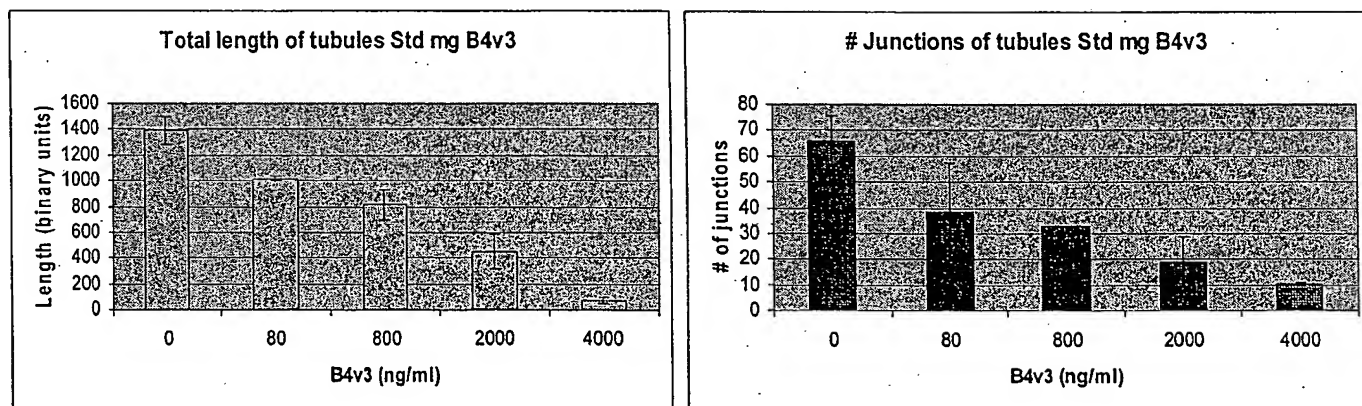


In Vitro Invasion Assay: Chemotaxis of HUAECs, measuring migration and degradation of basement membrane ability, was assessed using a modified Boyden chamber, transwell membrane filter inserts in 24 well plates, 6.5 mm diam, 8µm pore size, 10µm thick polycarbonate membranes. The upper surfaces of the transwell were pre-coated with matrigel. The cell suspensions of HUAECs in 0.25% BSA (2×10^5 cells/ml) in 200µl of EBM were seeded in the upper chamber and the B4v3 protein was added simultaneously with stimulant (VEGF or bFGF) to the lower compartment of the chamber and their migration across a polycarbonate filter in response to 10- 20 ng/ml of VEGF with or without 100nM- 1µM test compound was investigated. After incubation for 4-24h at 37, The upper surface of the filter was scraped with swab and filters were fixed and stained with Diff Quick. Triplicate. Ten random fields at 200x mag were counted and the results expressed as mean # per field

Fig. 19 B4v3 inhibits tubule formation on Matrigel.



B



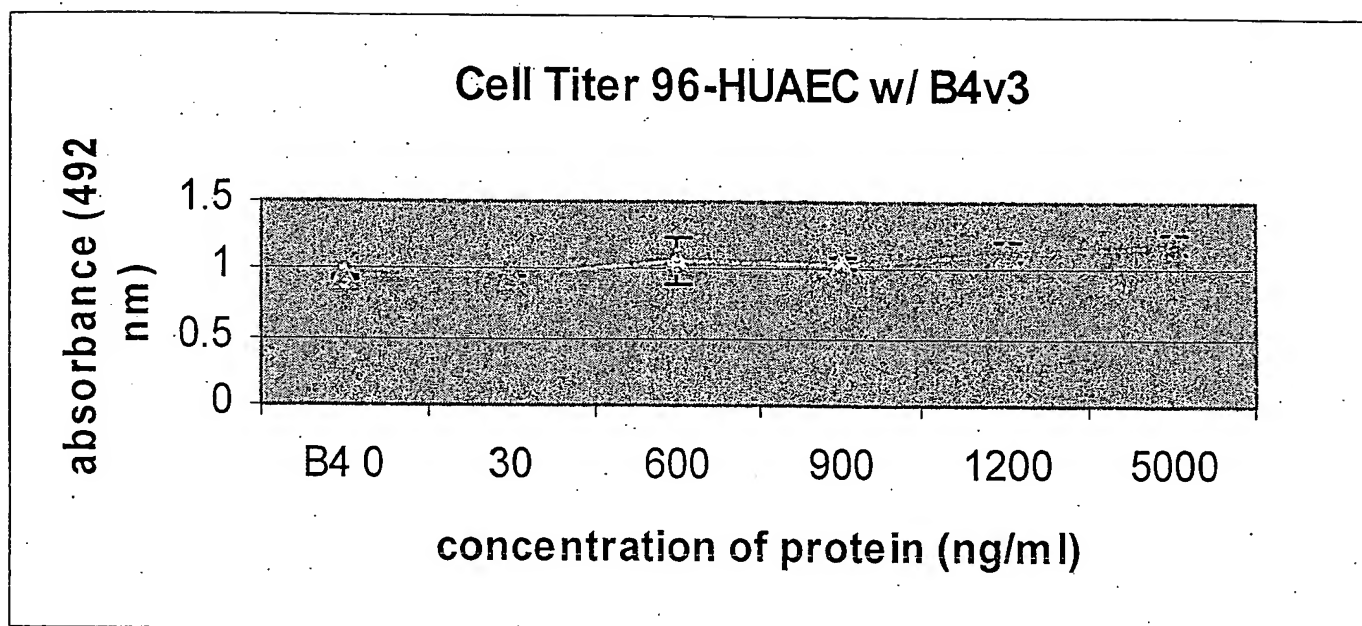
B4v3 inhibits tubule formation on Matrigel.

HUAEC cultures were cultured with B4v3, at 800, 2000, and 4000 ng/ml following seeding on STD matrigel in growth factor stimulated conditions, to analyze tubule formation. Cells were photographed 6h and 24h after seeding, 20X magnification, and the total length of the tubule-like network formed in the well, and # of junctions was established.

A, displays the strong inhibition of tubule formation by B4v3 in a representative experiment.

B, shows a quantitation, with AngioSys Software, of the reduction of tube-length obtained with B4v3 at increasing concentrations as well as a reduction in the number of junctions, in comparison to cells with no protein. Results are displayed as mean values \pm S.D. obtained from three independent experiments performed with duplicate wells.

Fig. 20

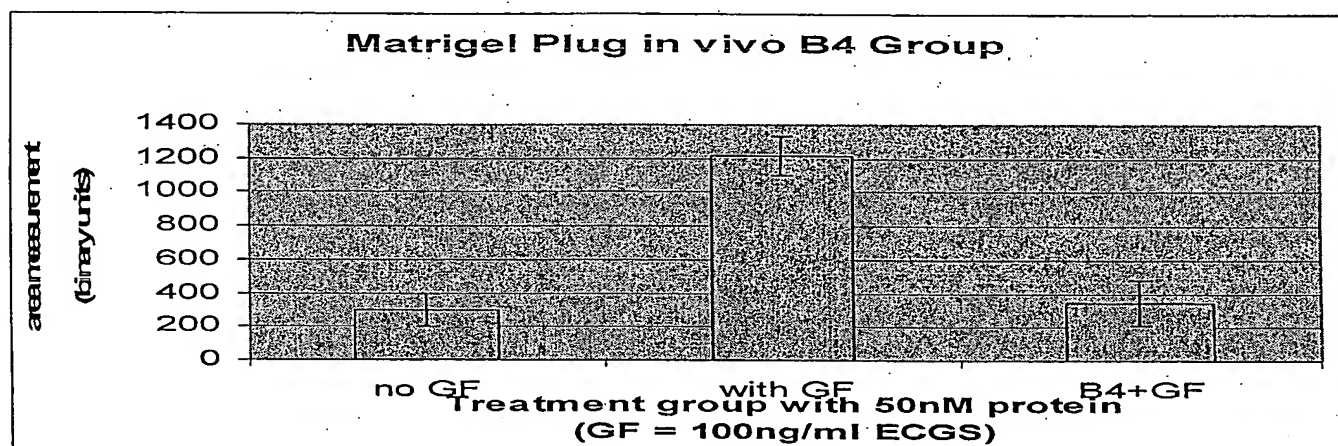
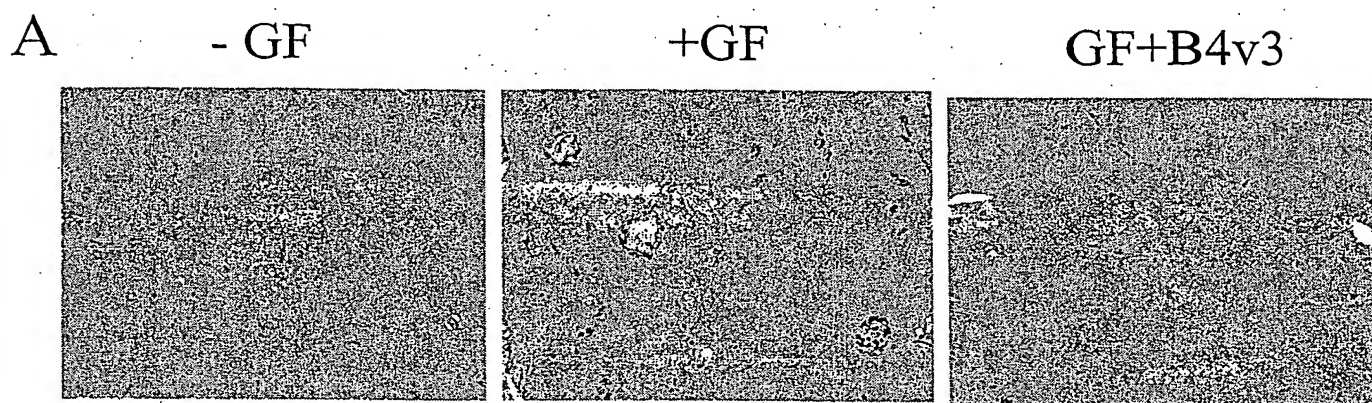


Cell viability assays:

Cell viability was determined using the (3-(4,5-dimethylthiazol-2-yl)-5-(3-carboxymethoxyphenyl)-2-(4-sulfophenyl)-2H-tetrazolium, inner salt (MTS) assay according to the instructions of the manufacturer (Promega, Madison, WI, USA).

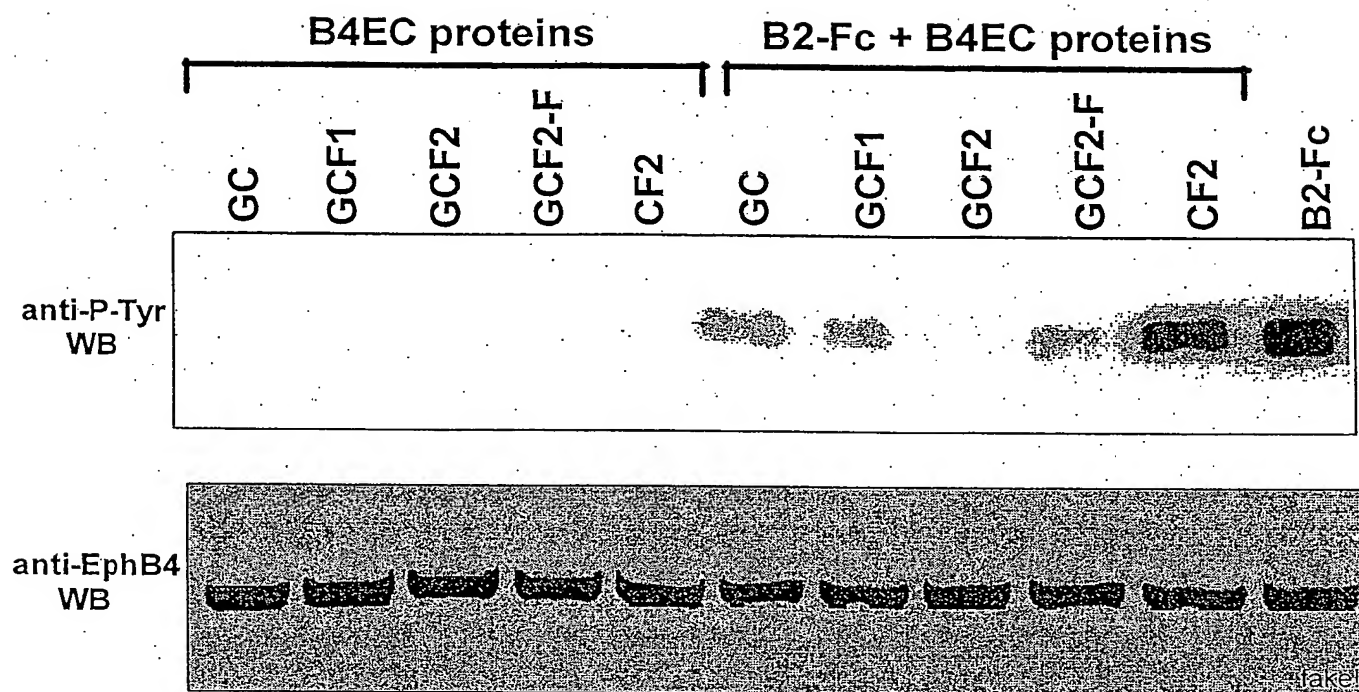
Fig. 21

B4v3 inhibits invasion and tubule formation by endothelial cells in the Murine Matrigel assay



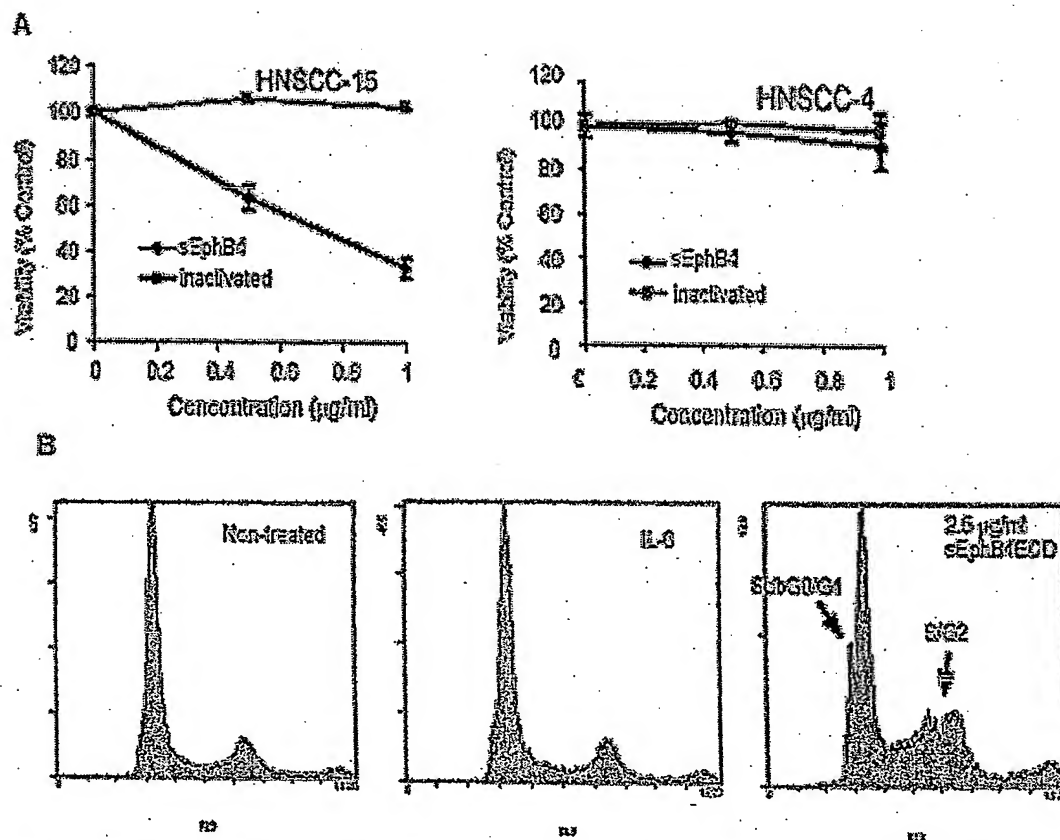
B4v3 inhibits invasion and tubule formation by endothelial cells in the murine Matrigel assay. B4v3 (50nM) was added to Matrigel solution containing ECGS (150ng/ml) and injected subcutaneously into BalbC nu/nu mice. After 6 days plugs were removed and processed in paraffin. Individual sections were either stained with hematoxylin (A) to detect total invading cells, photographed at 20X magnification or with Masson's Trichrome Top left of A B displays section of a Matrigel plug with no GF, top right of A displays section with B4IgG containing GF and lower left section contains GF, and lower right shows GF in the presence of B4v3. Significant invasion of endothelial cells is only seen in GF containing Matrigel. Top right displays an area with a high number of invaded cells induced by B4IgG, which signifies the dimeric form of B4v3. The left upper parts of the pictures correspond to the cell layers formed around the Matrigel plug from which cells invade toward the center of the plug located in the direction of the right lower corner. Total cells in sections of the Matrigel plugs were quantitated with Scion Image software. Results obtained from two experiments with duplicate plugs are displayed as mean values \pm S.D.

Fig. 22



Tyrosine phosphorylation of EphB4 receptor in PC3 cells in response to stimulation with EphrinB2-Fc fusion in presence or absence of EphB4-derived recombinant soluble proteins.

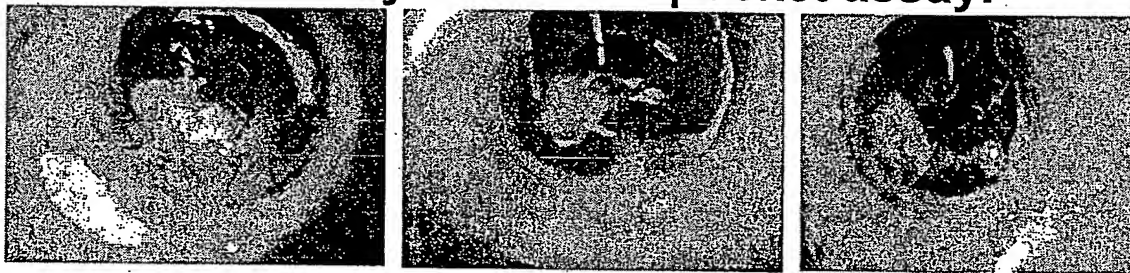
Fig. 23



Soluble EphB4ECD effects on viability and cell cycle. A) 3-day cell viability assay of two HNSCC cell lines. Cells were seeded on 48-well plates at equal densities and treated with 0, 0.5 or 1 µg/ml sEphB4ECD. Viability was determined on day 3 by MTT assay. Shown is the mean and SEM of triplicate samples. B) FACS analysis of cell cycle in HNSCC-15 cells treated as in A. It was previously determined that IL-6 had no inhibitory effect on viability. Treatment of these cells resulted in an accumulation in subG0/G1 and G2 phases as indicated by the arrows.

Fig. 24

B4v3 inhibits neovascular response in a murine corneal hydon micropocket assay.



+GF

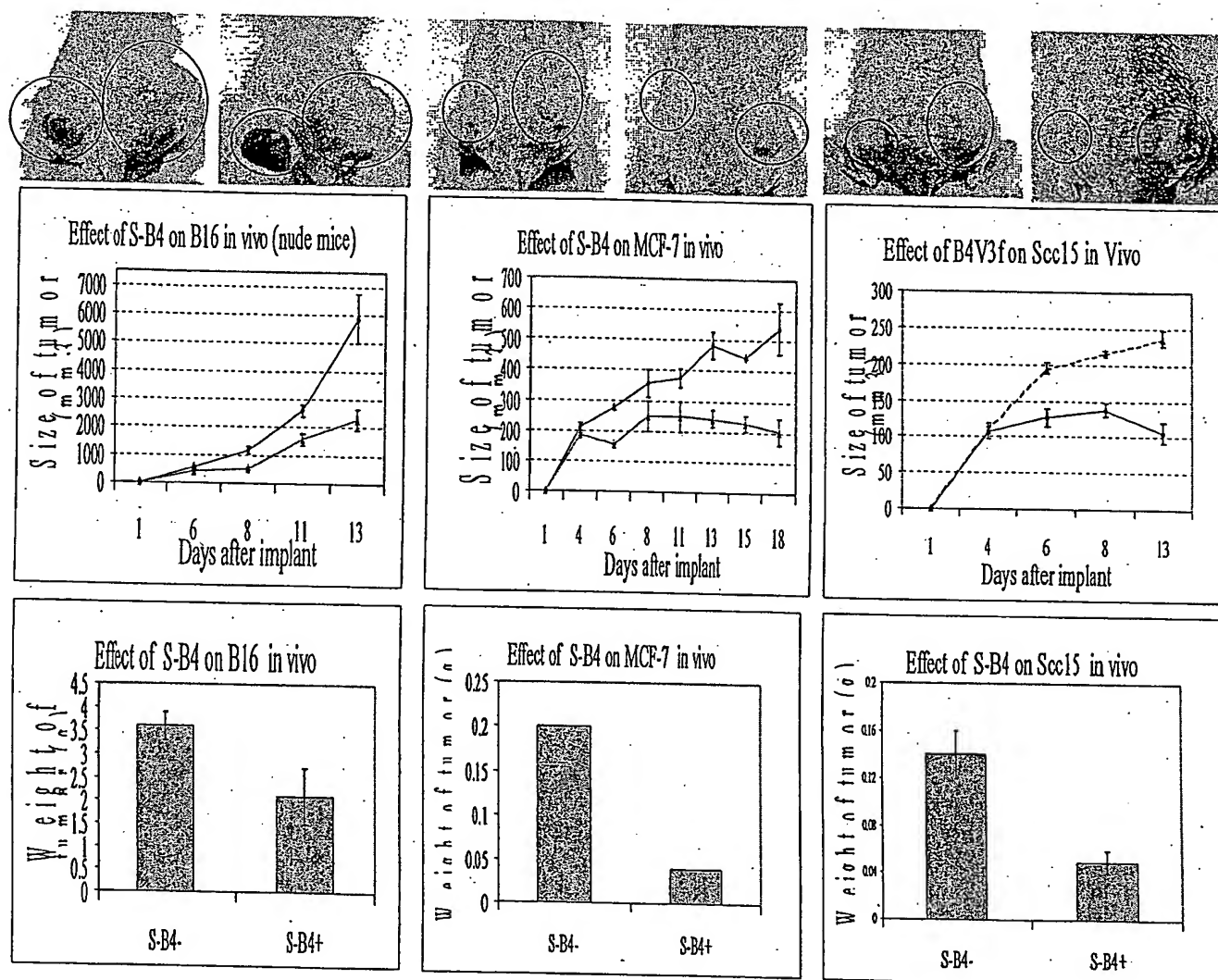
**B4
+GF**

-GF

B4v3 inhibits neovascular response in a murine corneal hydon micropocket assay.

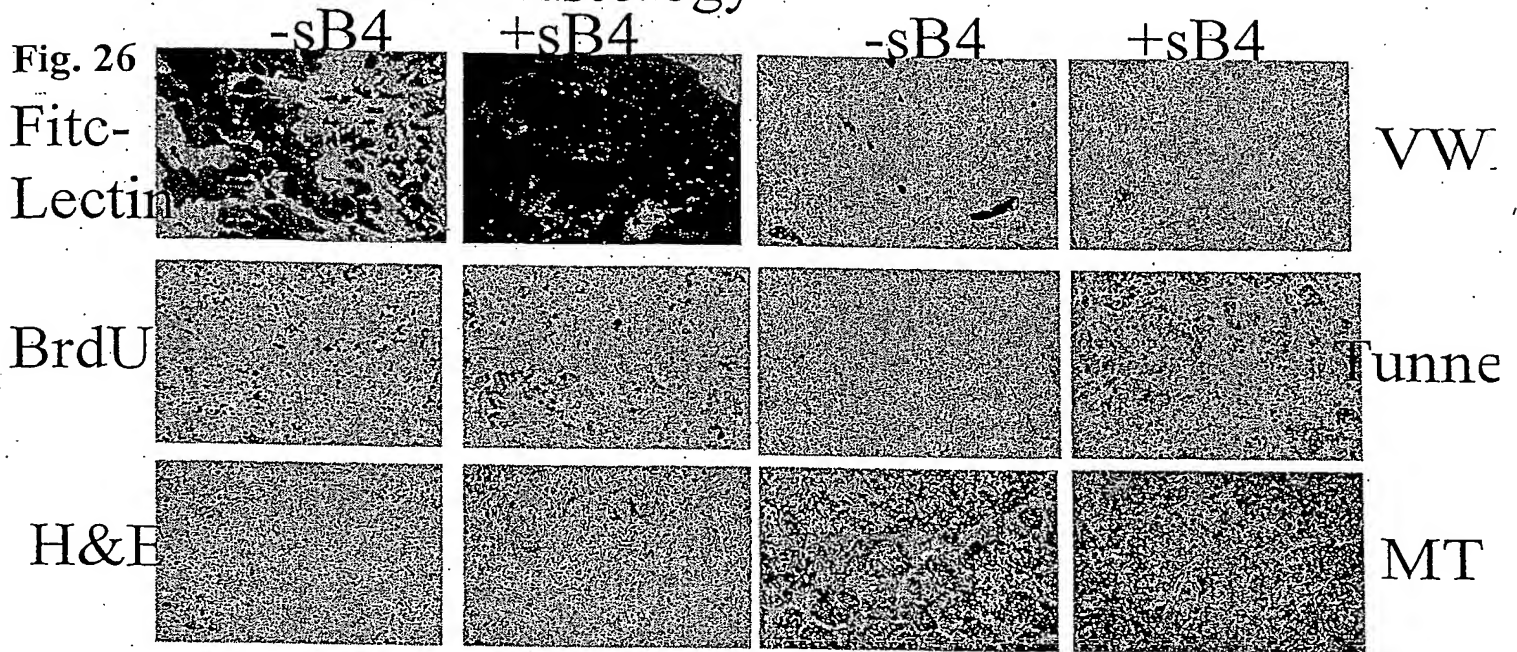
B4v3 (180ng) was added to hydon and sucralfate (45ug) with or without basic fibroblast growth factor (bFGF) (100ng) and pellets formed. The pellets were selected and inserted into a micropocket into corneas of BalbC nu/nu mice. After 3 days pellets were removed and processed in freezing compound. Only the bFGR-sucralfate pellet, top left, induced an intense neovascular response originating from the limbal vessels and reaching the pellet on day 3 after implantation. Pellets containing bFGF and sucralfate with B4v3 and Bsf, top right and bottom left respectively, did not produce an angiogenic response above background, lower right, on day 3 after implantation.

Fig. 25

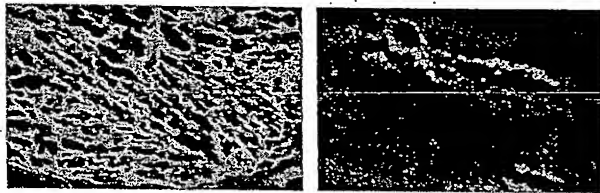


SCC15, B16, and MCF-7 co-injected with sB4v3 in the presence of matrigel and growth factors, inhibits the *in vivo* tumor growth of these cells. (A) sB4v3, 40mg per kg body weight were subcutaneously coinjected with $\times 10^6$ cells in a matrigel preparation. The representative picture shows retarded tumor growth in the presence of sB4 (left flank) compared with PBS control treatment (right flank). (B) Treatment with sB4 significantly inhibited human SCC, B16, and MCF-7 tumor growth compared with control-treated mice ($p < 0.05$). (C) Treatment with sB4 significantly inhibited tumor weight compared with control-treated mice ($p < 0.05$). Data are expressed as mean \pm SEM. * $p < 0.05$

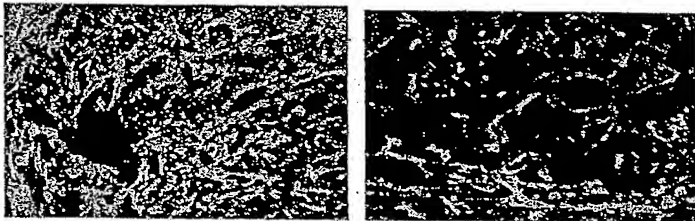
SCC15 Tumor histology



B16



Mcf-7



Soluble EphB4 causes apoptosis, necrosis and decreased angiogenesis in three tumor types, B16 melanoma, SCC15, head and neck carcinoma, and MCF-7 Breast carcinoma. Tumors were injected premixed with Matrigel plus growth factors and soluble EphB4 subcutaneously. After 10 to 14 days, the mice were injected intravenously with fitc-lectin (green) to assess blood vessel perfusion. Tumors treated with control PBS displayed abundant tumor density and a robust angiogenic response. Tumors treated with sEphB4 displayed a decrease in tumor cell density and a marked inhibition of tumor angiogenesis in regions with viable tumor cells, as well as tumor necrosis and apoptosis.

Figure 27

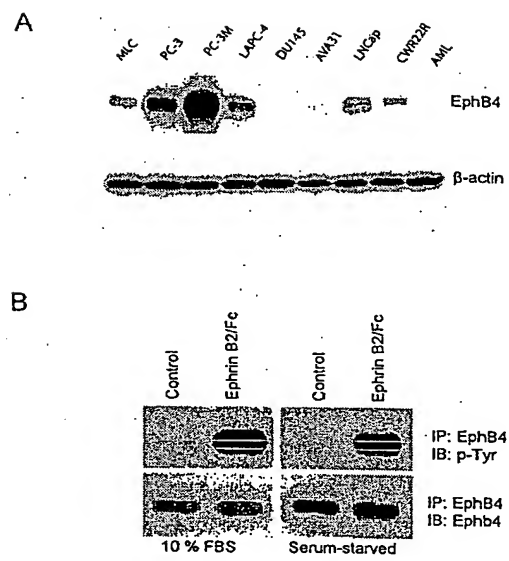
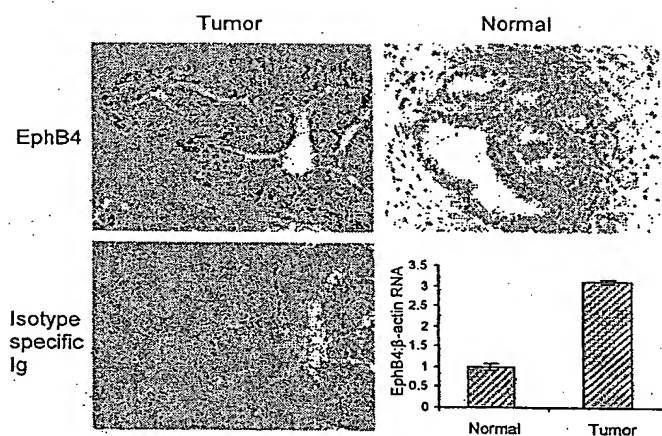


Figure 28



| EPHB4 staining in prostate tissues array | | |
|--|----------|----------|
| | negative | positive |
| Normal (n = 20) | 17 | 3 |
| Tumor (n = 32) | 8 | 24 |

$P = 3.8 \times 10^{-5} \chi^2$ analysis

Figure 29

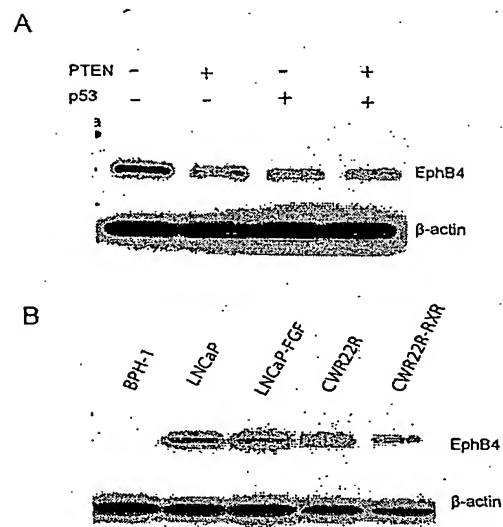


Figure 30

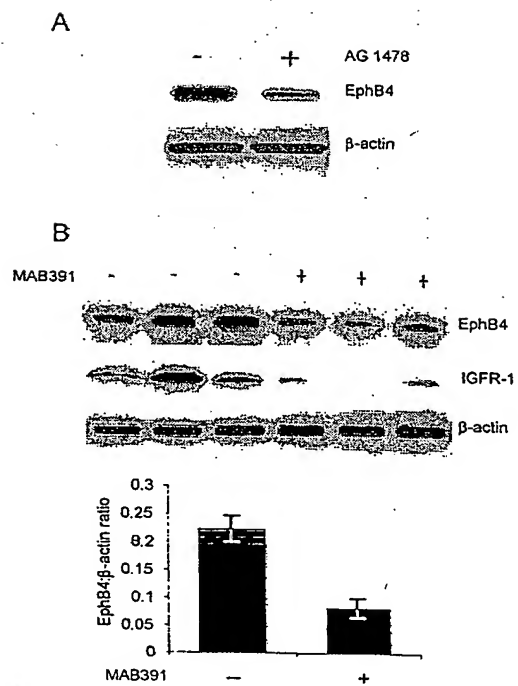


Figure 31

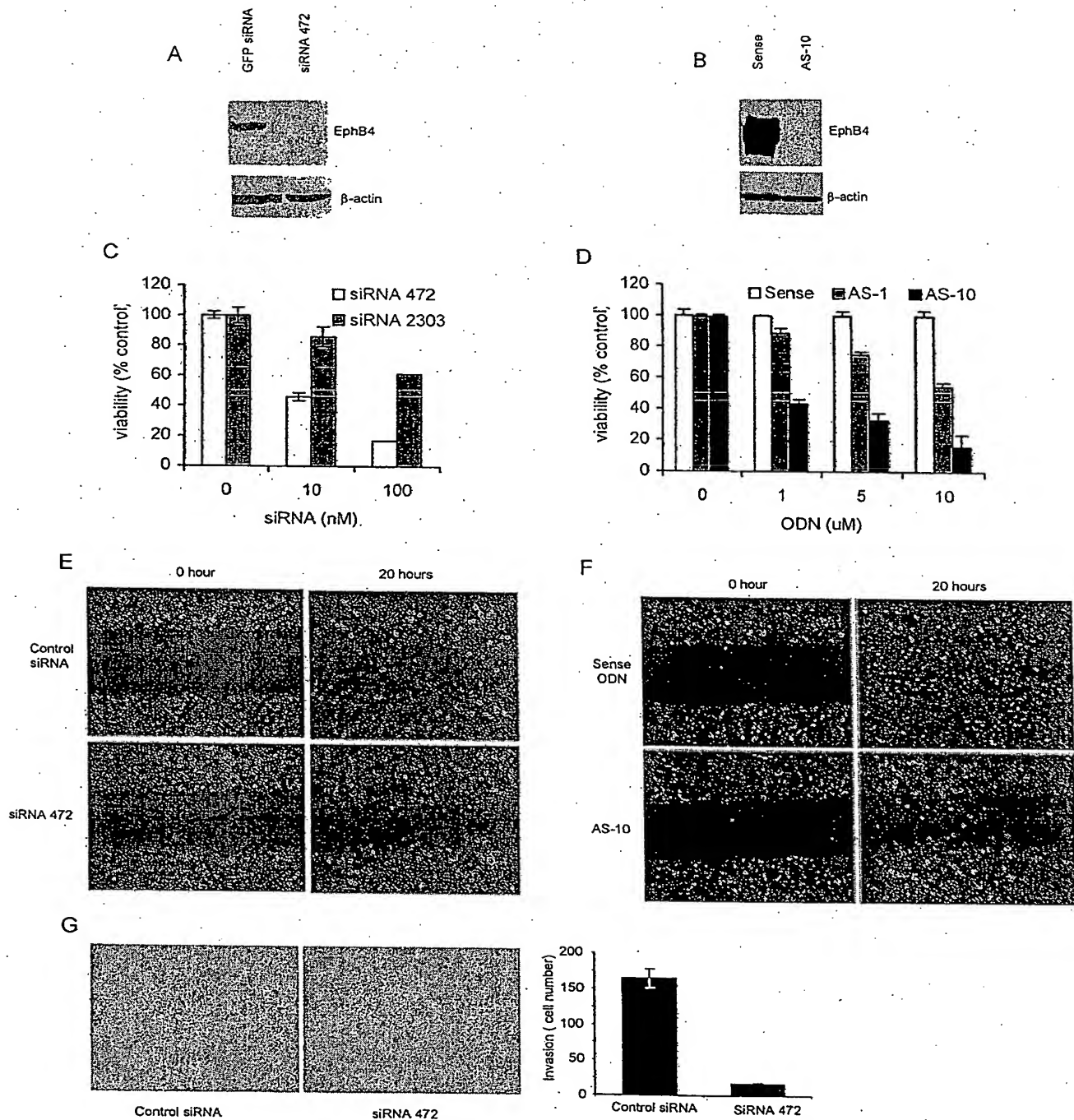
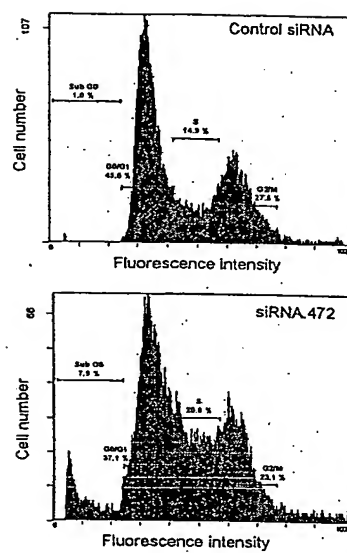
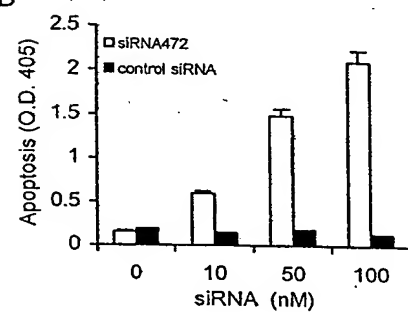


Figure 32

A

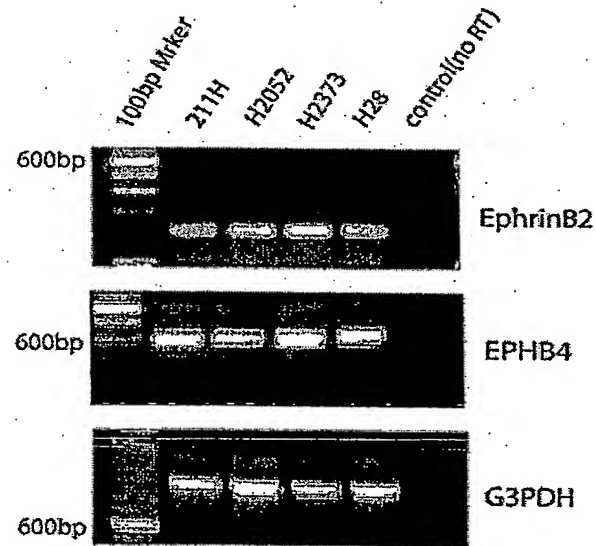


B



Figures and Legends

A.



B.

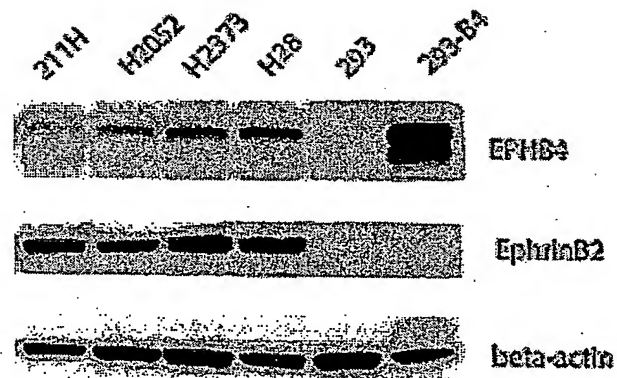


Fig. 33

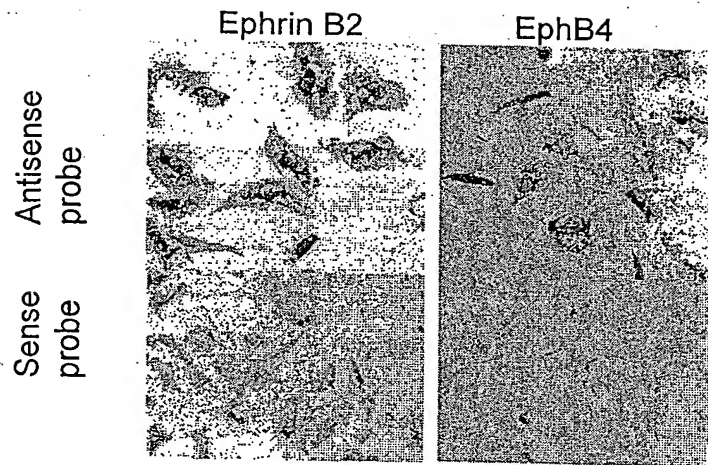


Fig. 34. Expression of ephrin B2 and EphB4 by in situ hybridization in mesothelioma cells. NCI H28 mesothelioma cell lines cultured in chamber slides hybridized with antisense probe to ephrin B2 or EphB4 (top row). Control for each hybridization was sense (bottom row). Positive reaction is dark blue cytoplasmic stain.

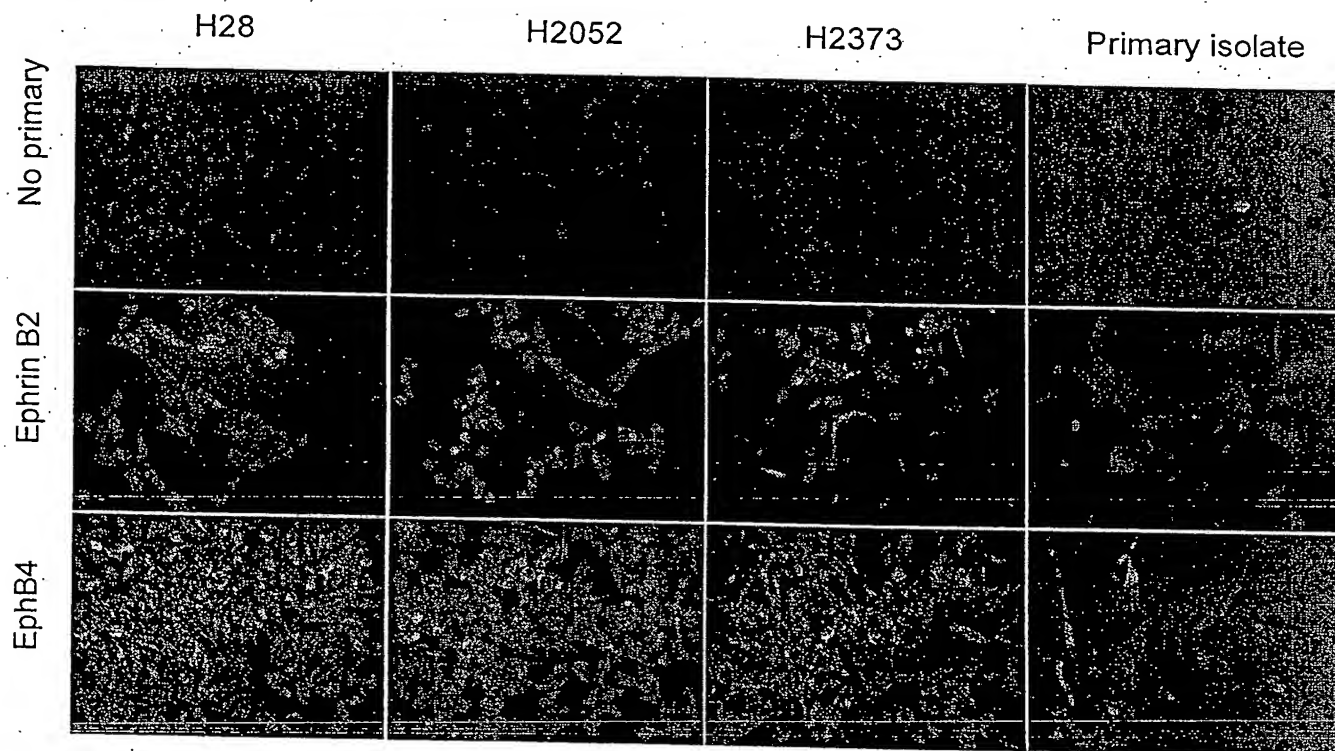


Fig. 35. Cellular expression of EphB4 and ephrin B2 in mesothelioma cultures. Immunofluorescence staining of primary cell isolate derived from pleural effusion of a patient with malignant mesothelioma and cell lines NCI H28, NCI H2373, and NCI H2052 for ephrin B2 and EphB4. Green color is positive signal for FITC labeled secondary antibody. Specificity of immunofluorescence staining was demonstrated by lack of signal with no primary antibody (first row). Cell nuclei were counterstained with DAPI (blue color) to reveal location of all cells. Shown are merged images of DAPI and FITC fluorescence. Original magnification 200X.

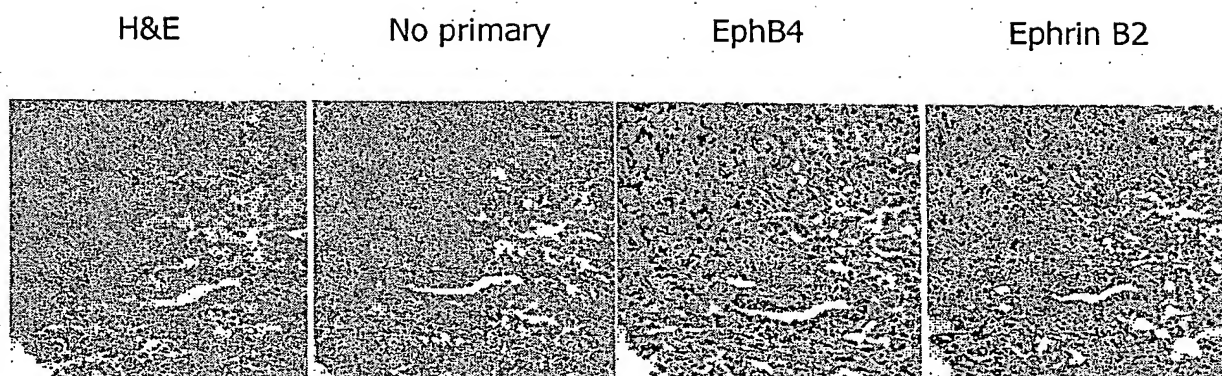
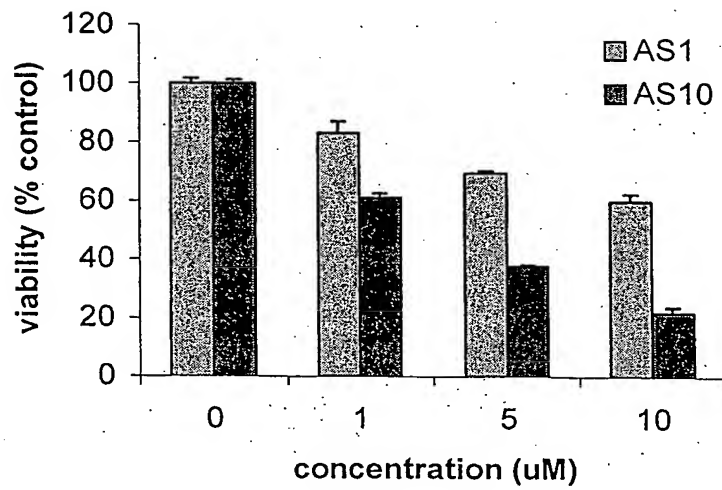


Fig. 36. Expression of ephrin B2 and EphB4 in mesothelioma tumor. Immunohistochemistry of malignant mesothelioma biopsy. H&E stained section to reveals tumor architecture; bottom left panel is background control with no primary antibody. EphB4 and ephrin B2 specific staining is brown color. Original magnification 200X.

A.

Effect of EPHB4 antisense ODN on the growth of H28 cells



B.

Effect of EPHB4 siRNA 472 on the growth of H28 cells

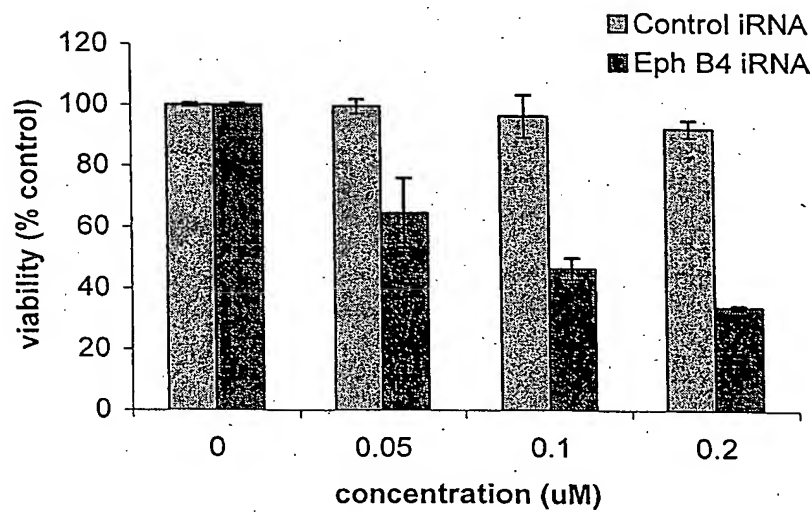
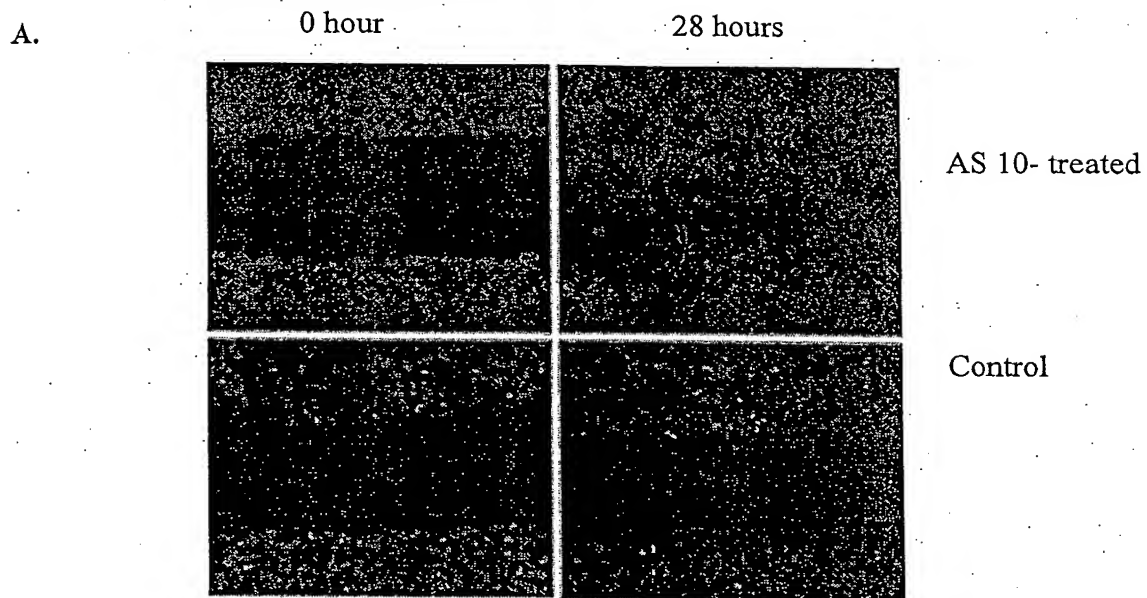


Fig. 37



B. Migration Study of H28 with siRNA472(Boyden Chamber)

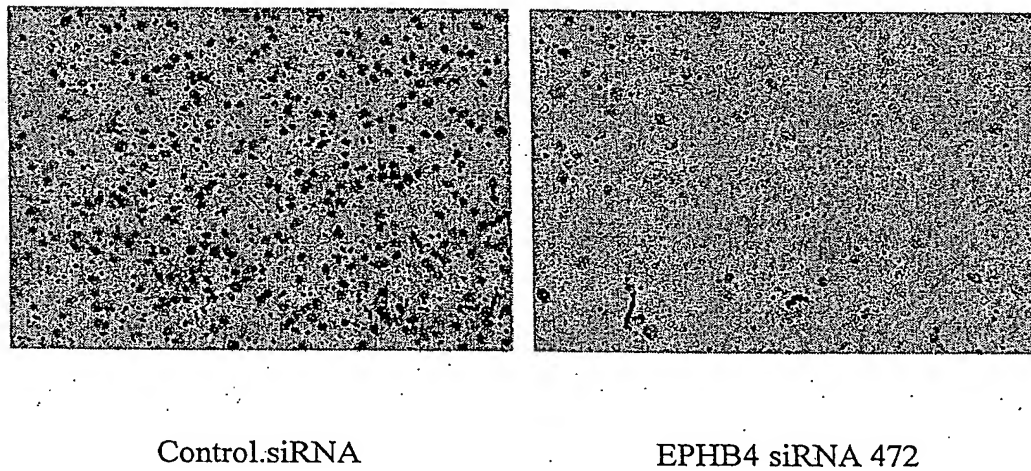


Fig. 38

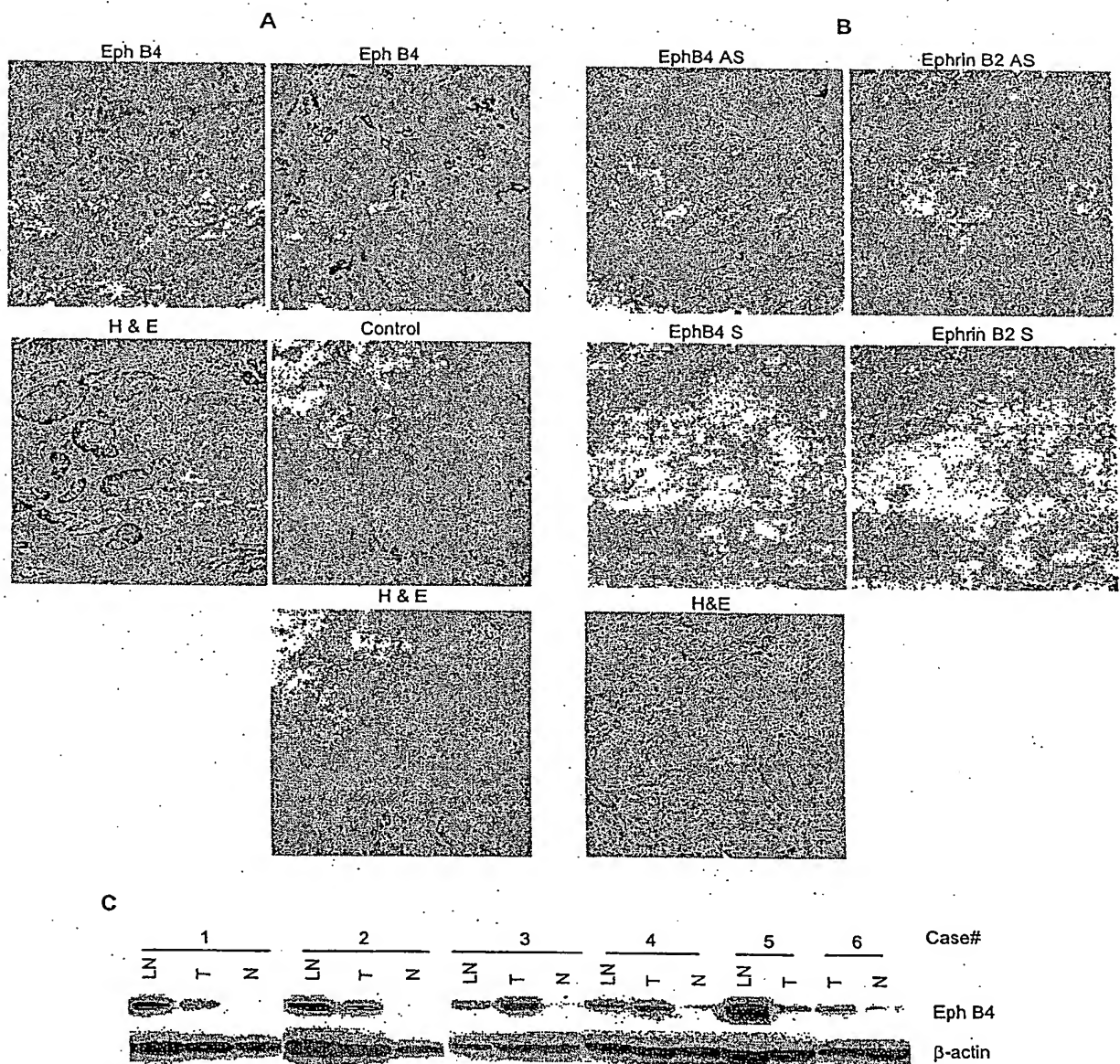


Fig. 39

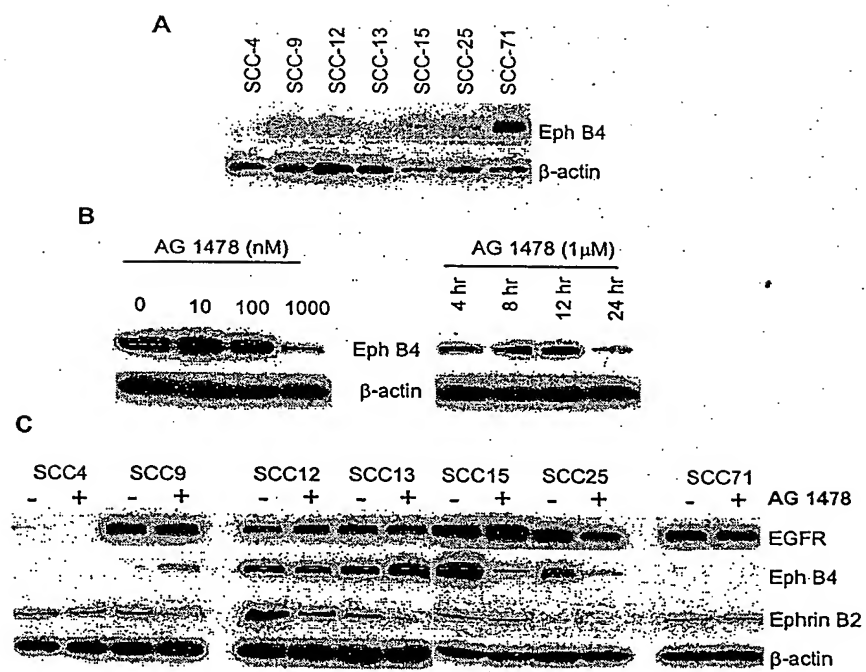


Fig. 40

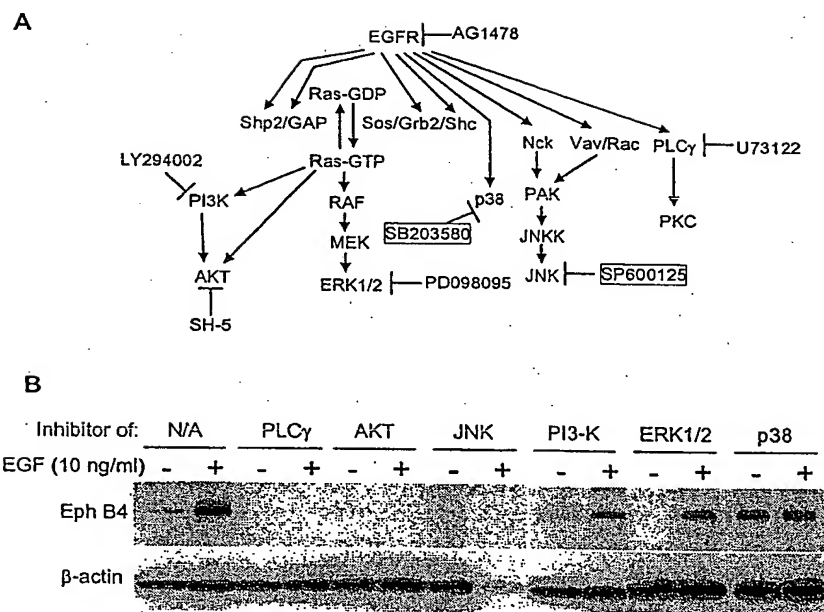


Fig. 41

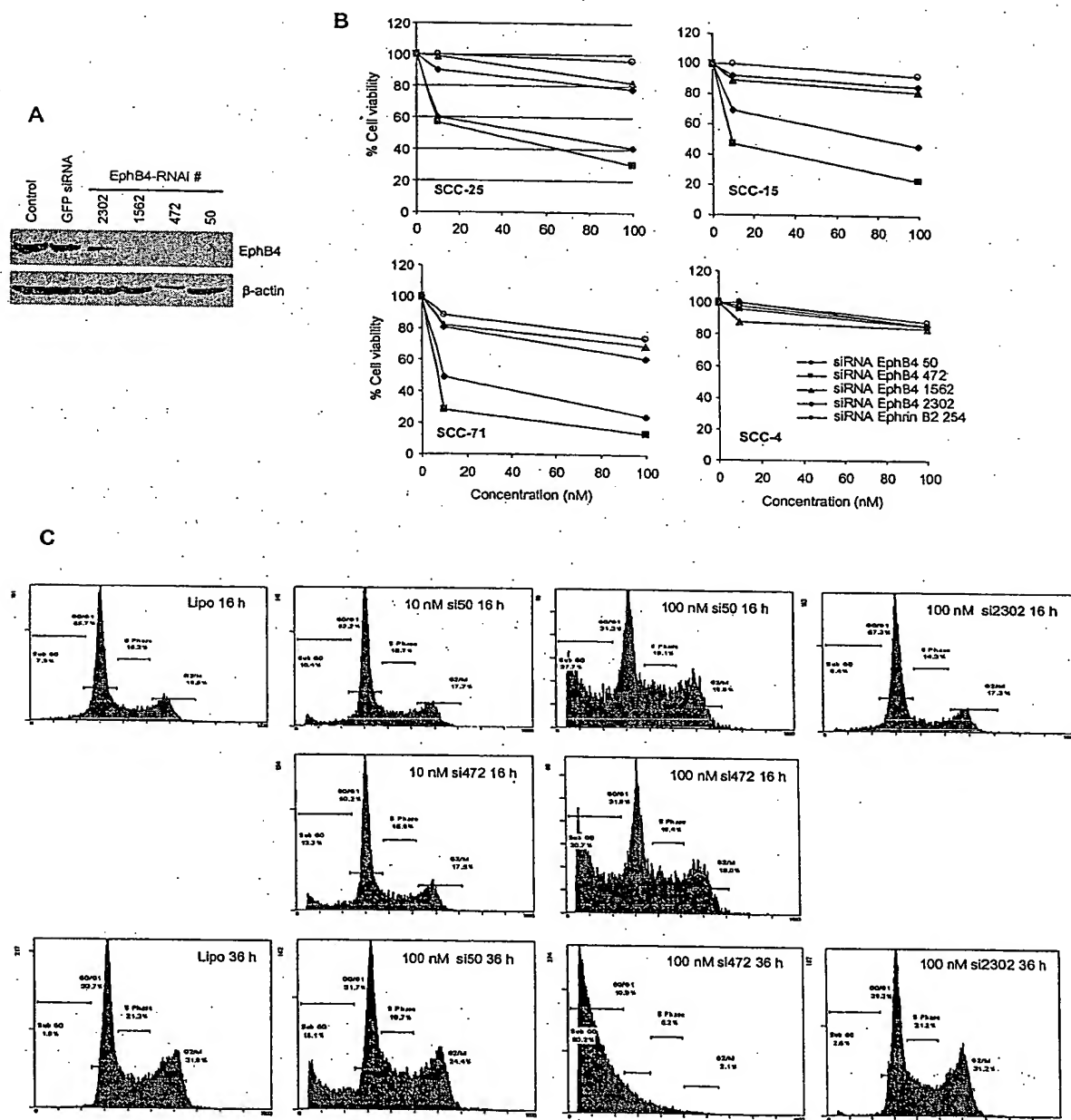


Fig. 42

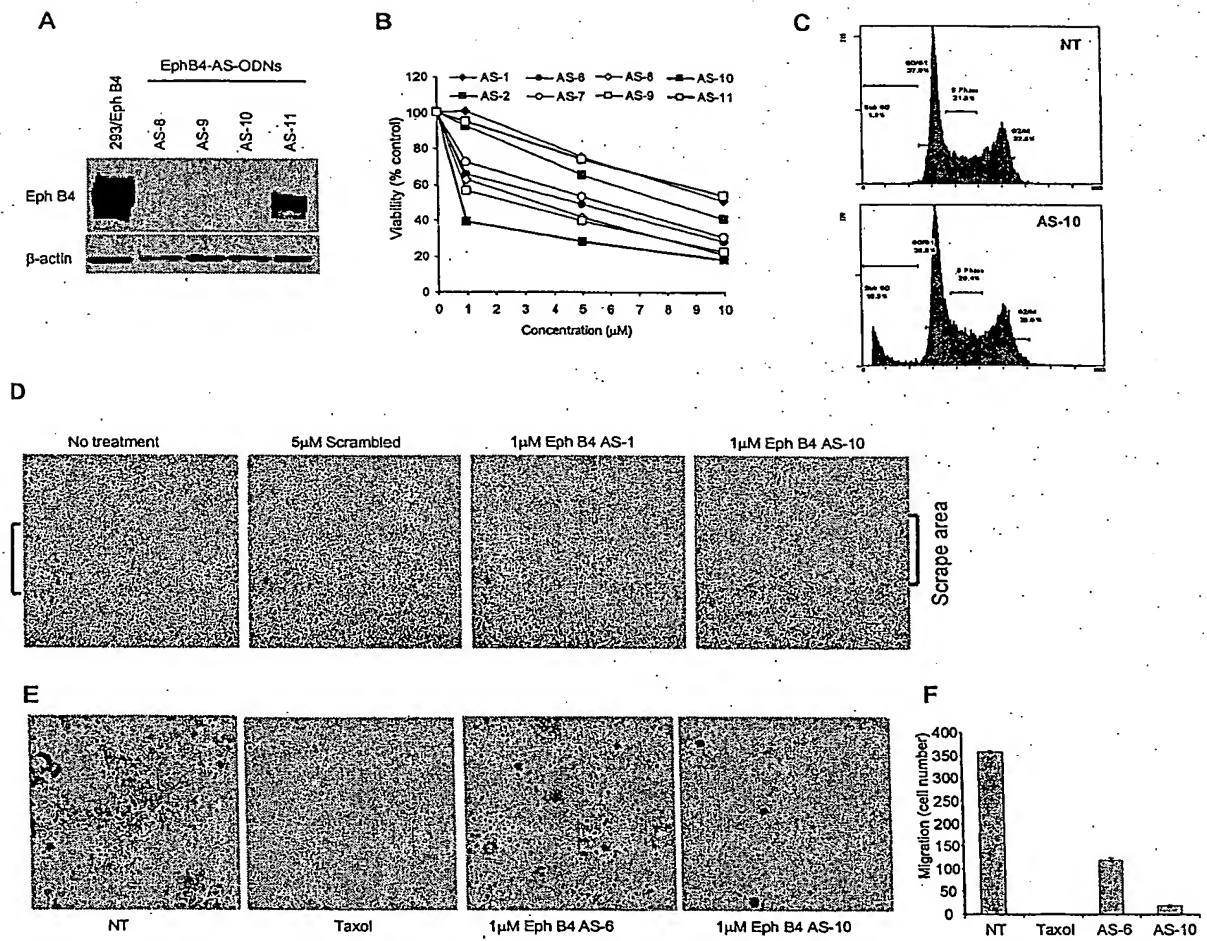


Fig. 43

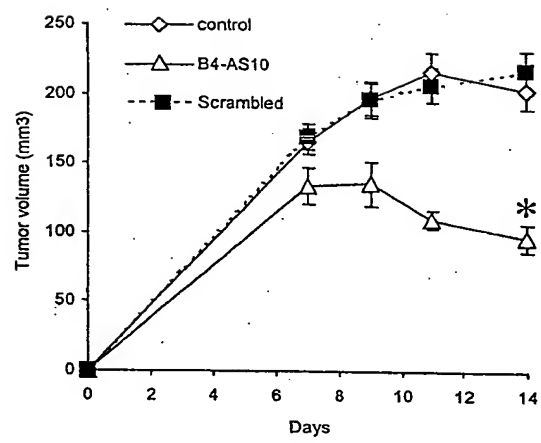
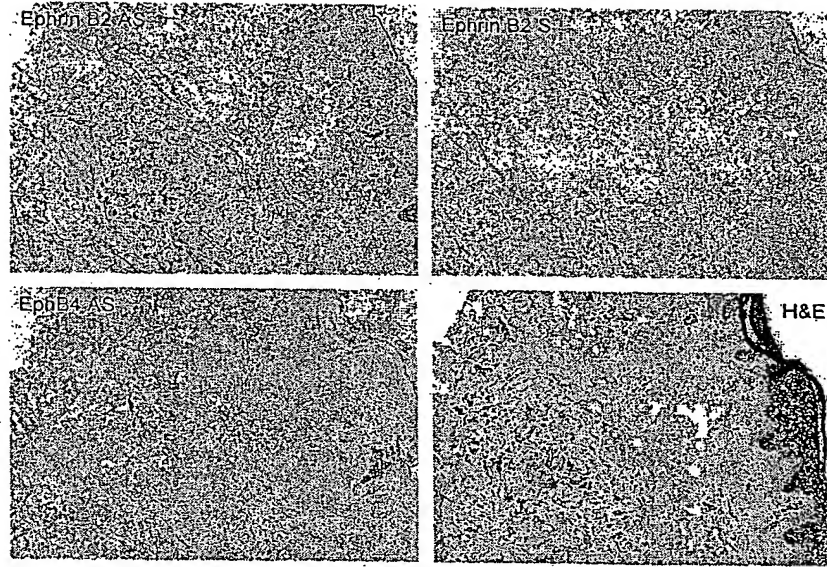


Fig. 44

Fig. 45

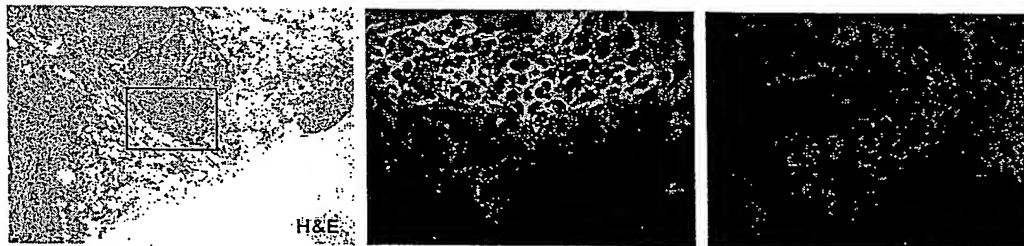
A



squamous cell carcinoma



B



C

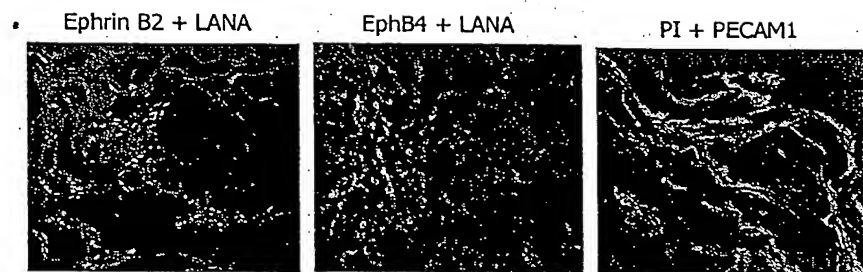


Fig. 46

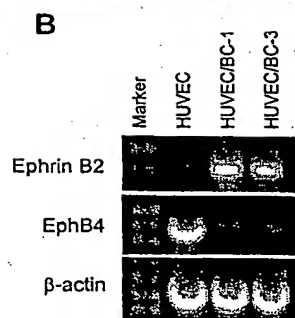
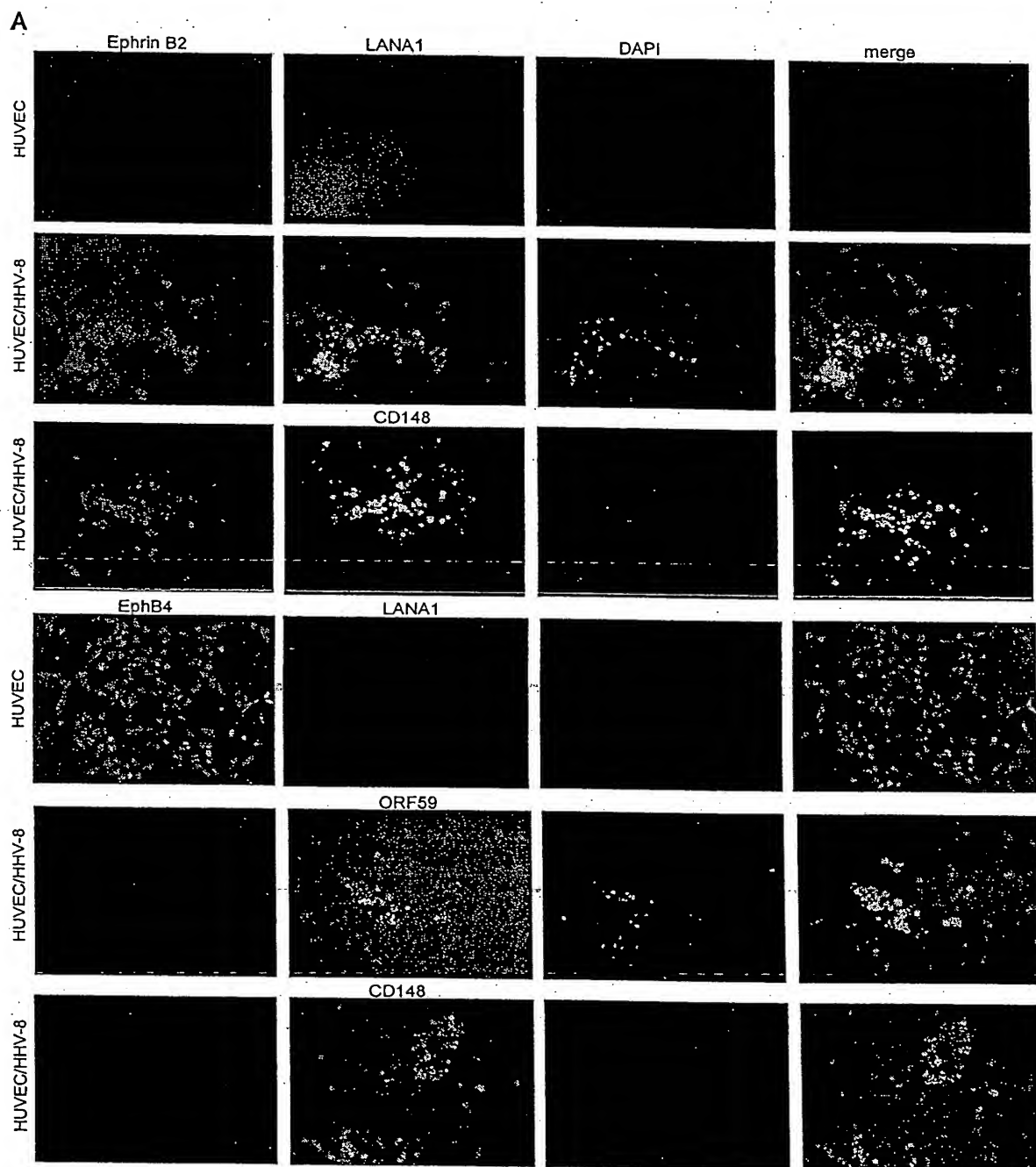


Fig. 47

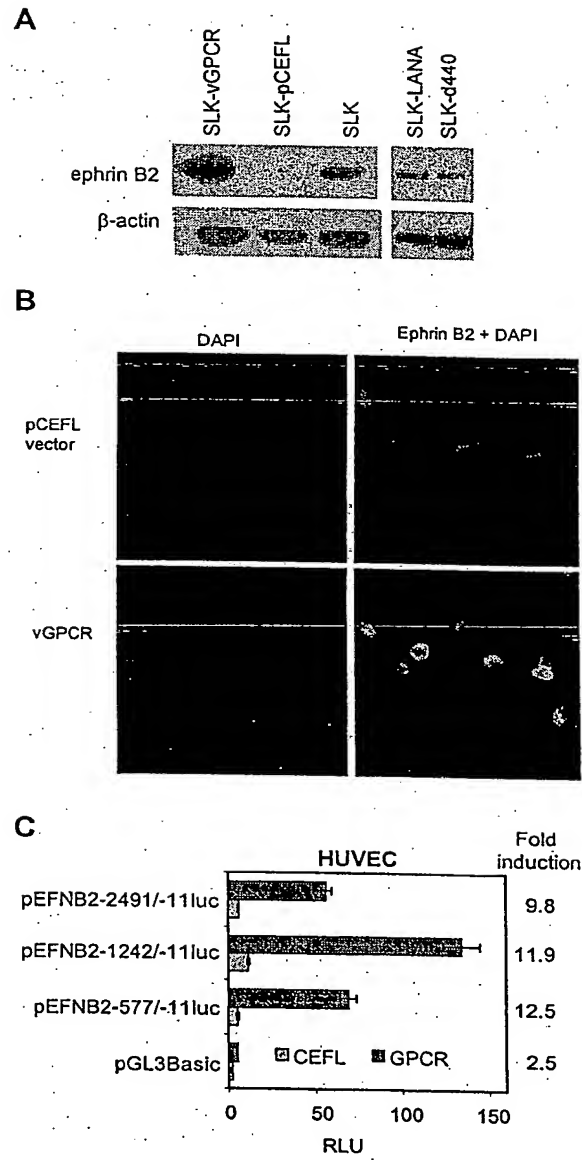


Fig. 48

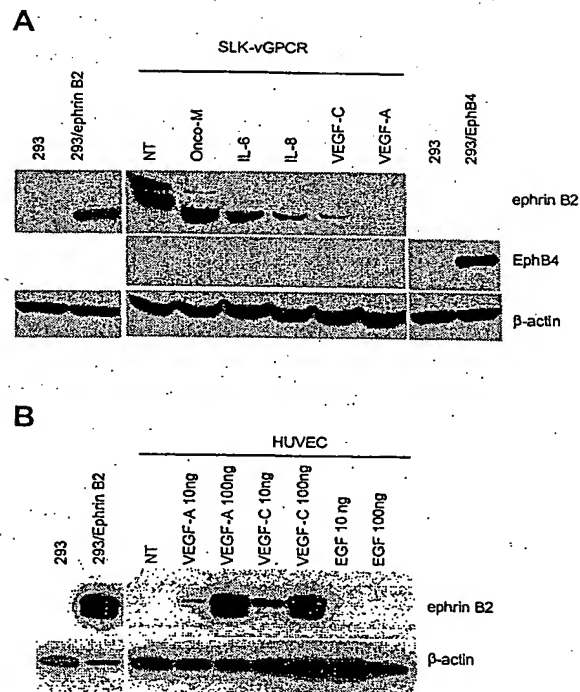


Fig. 49

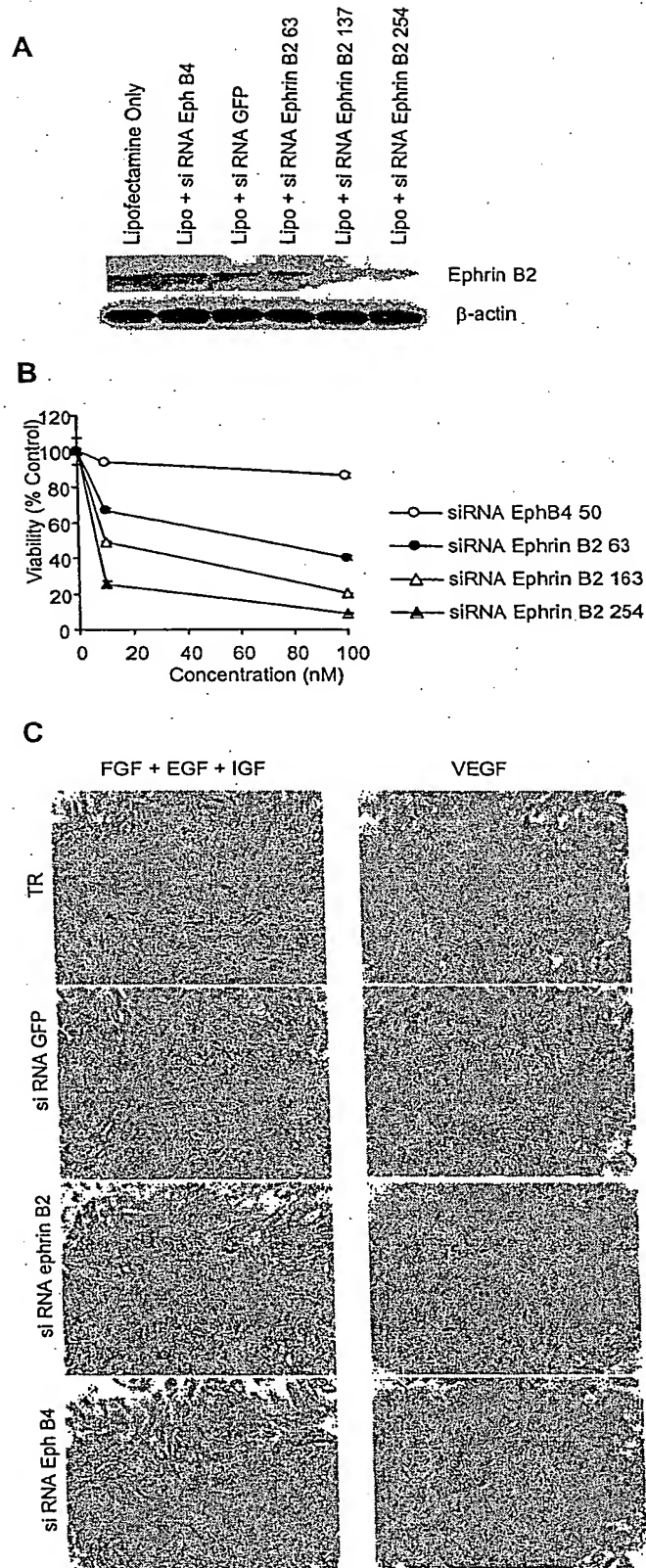


Fig. 50

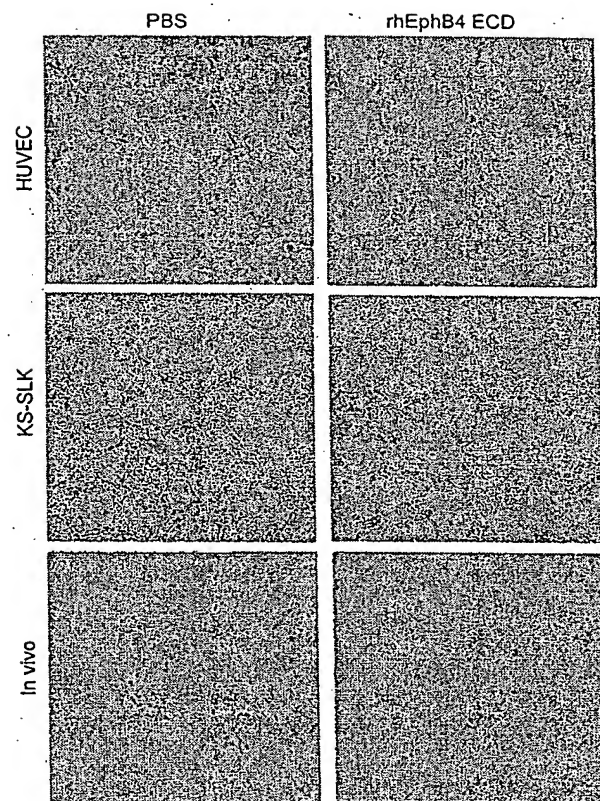
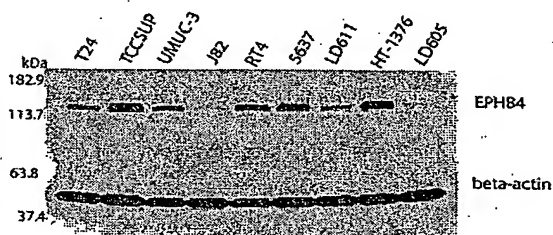


Fig. 51

Expression of EPHB4 in bladder cancer cell lines



Regulation of EPHB4 expression by EGFR signaling pathway

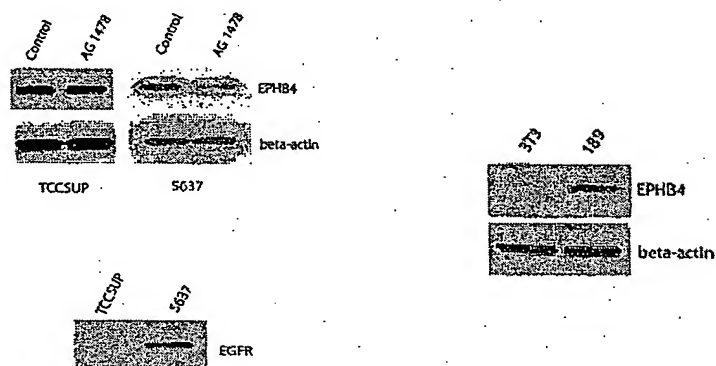


Fig. 52

Transfection of p53 inhibit the expression of EPHB4 in 5637 cell

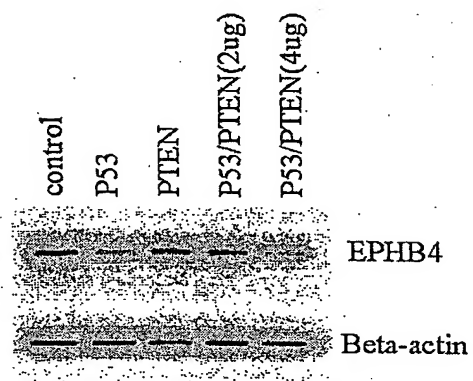
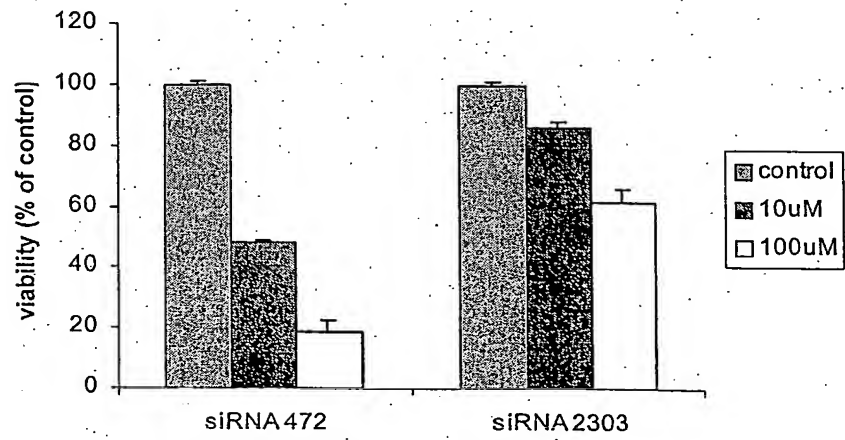


Fig. 53

Growth inhibition of bladder cancer cell line(5637) upon treatment with EPHB4 siRNA 472



Apoptosis Study of 5637 cells transfected with EPHB4 siRNA 472

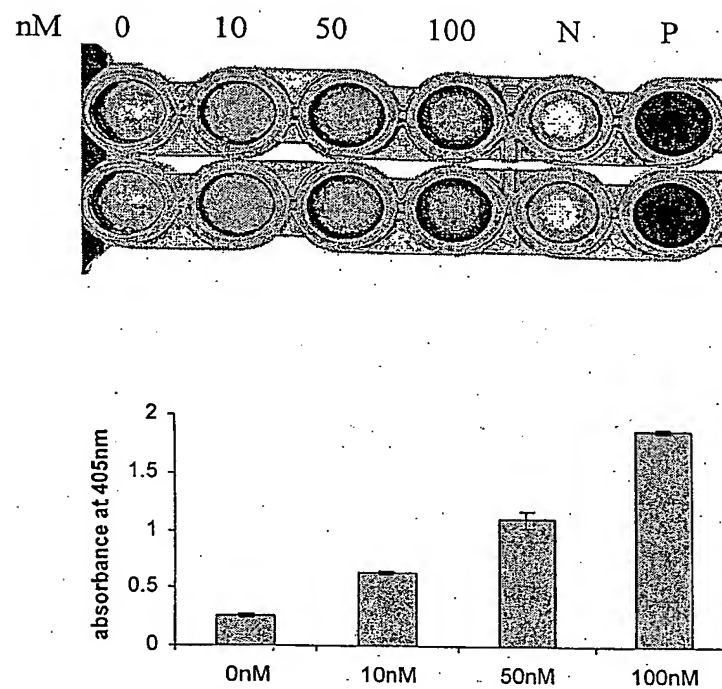


Fig. 54

Cell migration study of 5637 cell upon treatment with AS10(10uM)

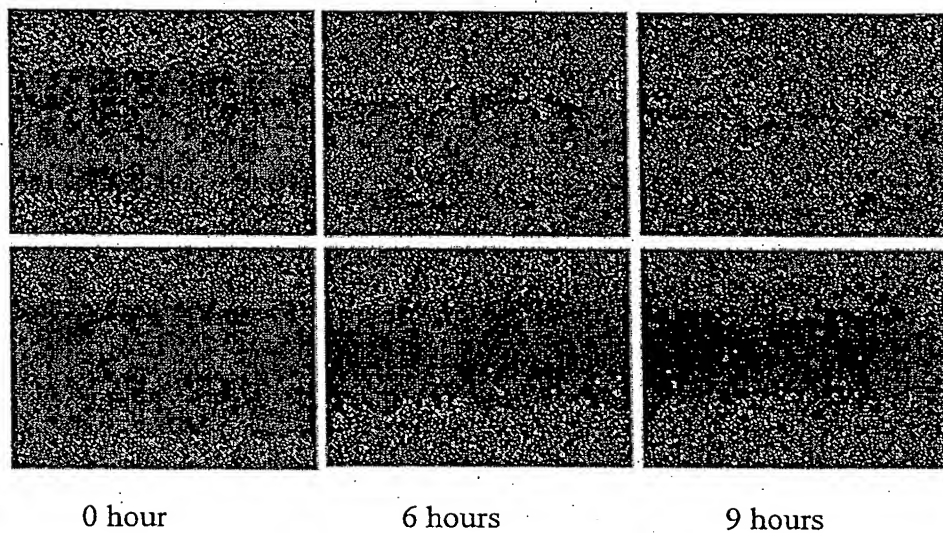
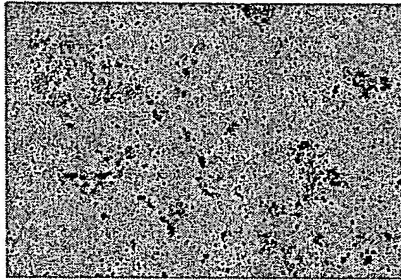
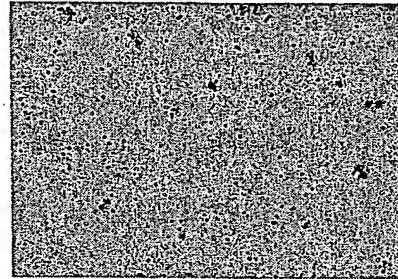


Fig. 55

Invasion study of 5637 cell transfected with siRNA 472 or control siRNA



Control



siRNA472

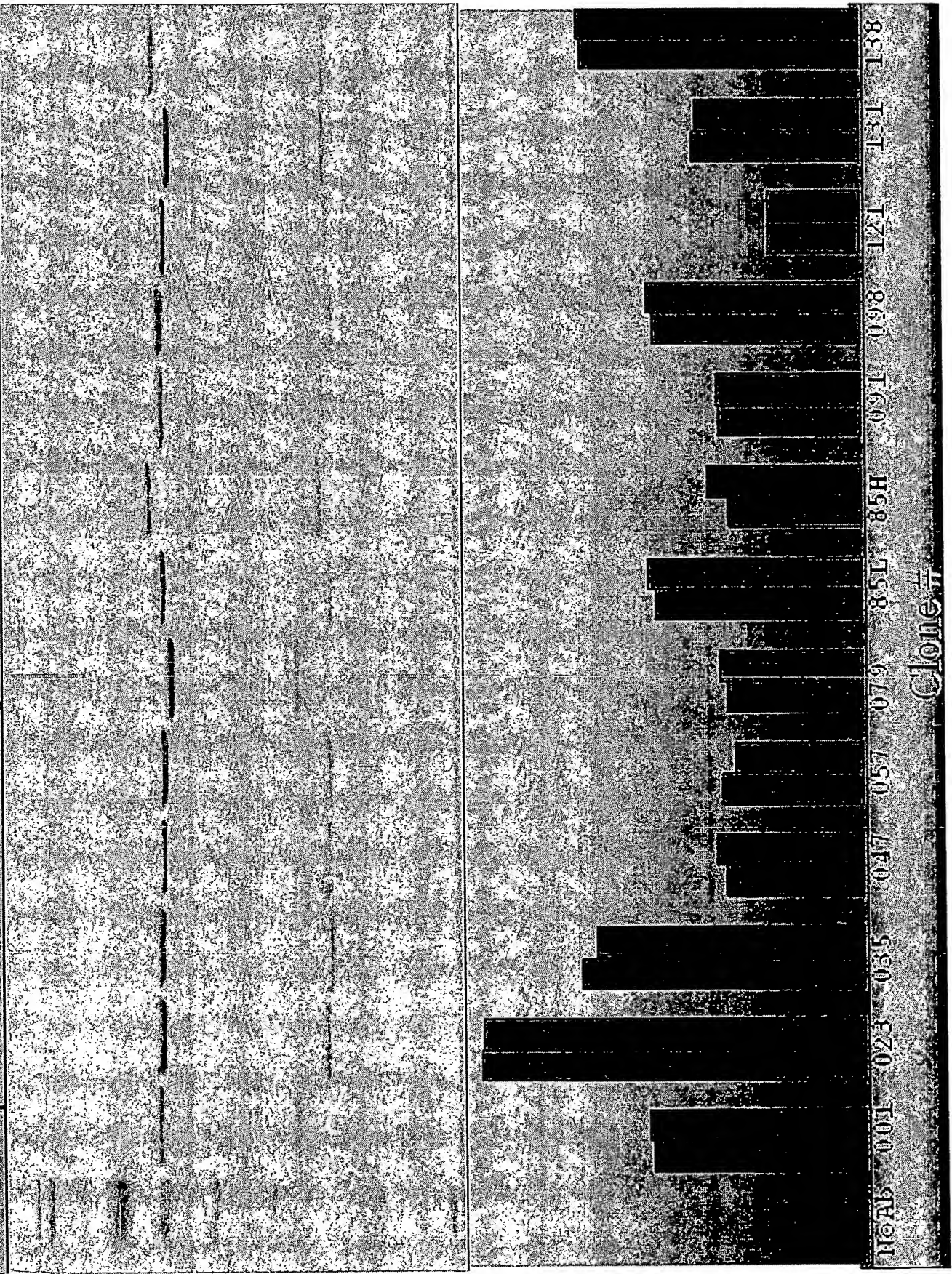
Co
ntr
ol

si
R
N
A4
72

Fig. 56

Fig. 57

Comparison of moABs by G250 and in Pull Down Assay



SCC15/MG xenograft Tumor regression

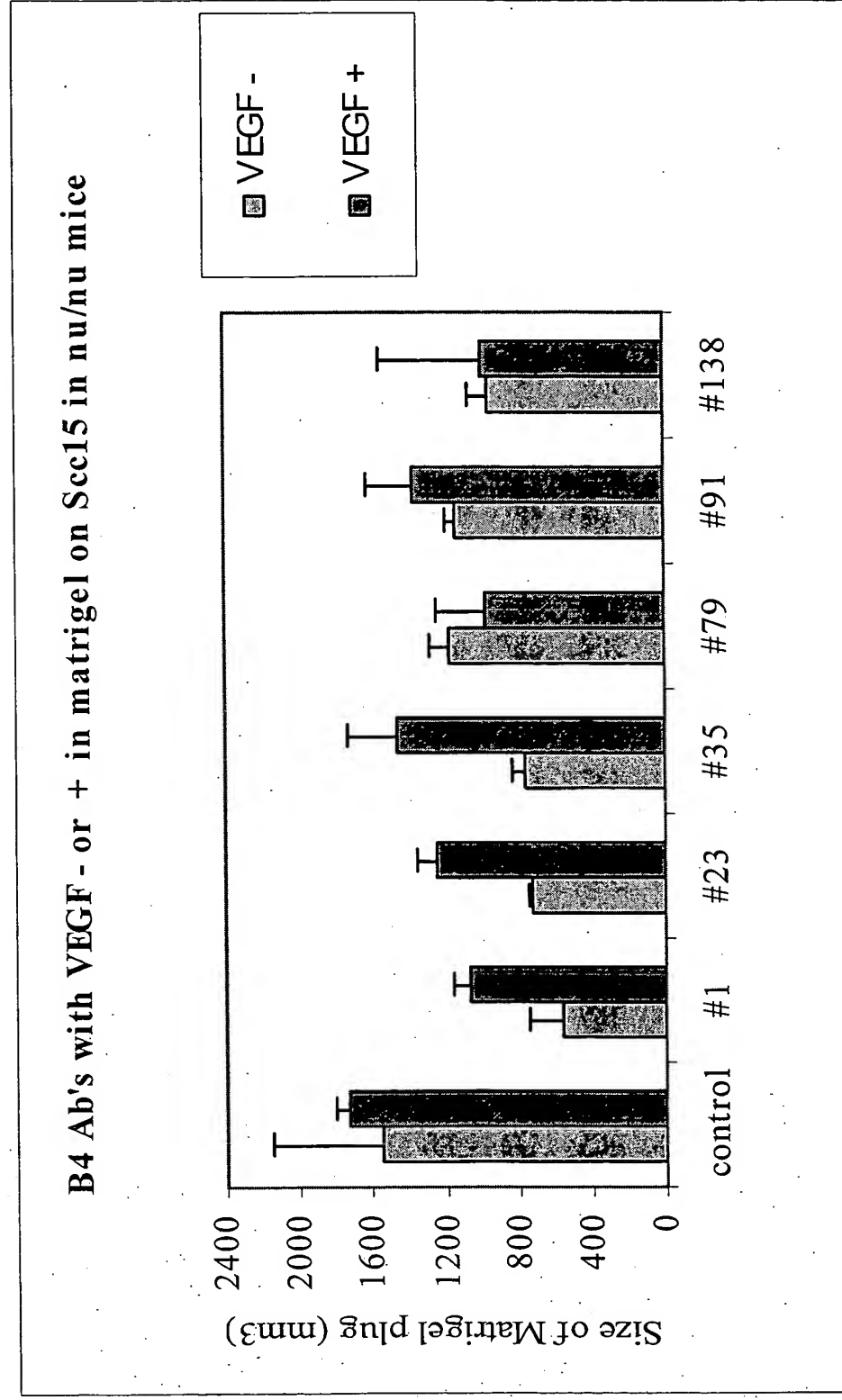


Fig. 59

Effect of B4 antibodies on SCC15 Tumor histology

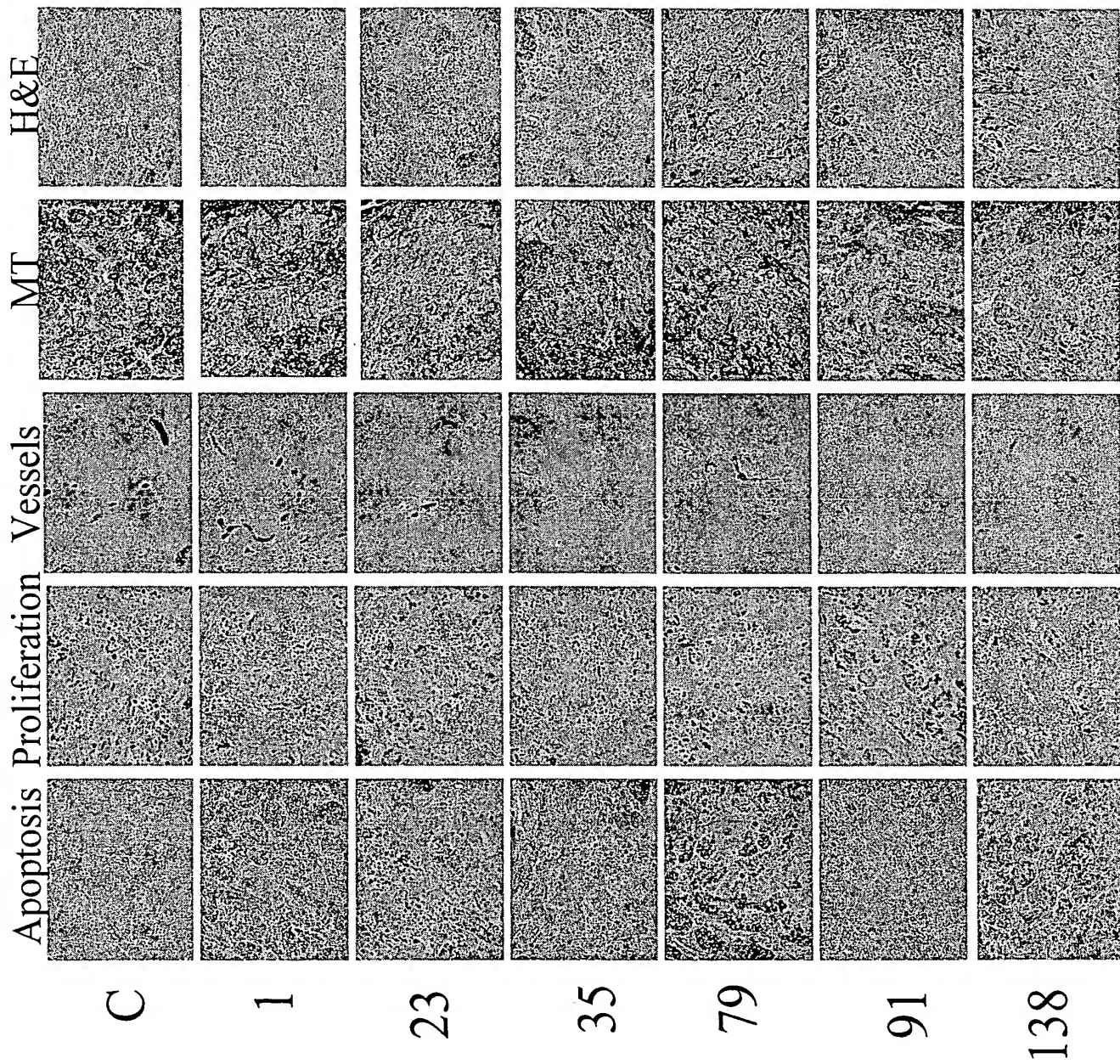


Fig. 60

SCC15/IP,SC B4 Ab treated xenograft Tumor regression

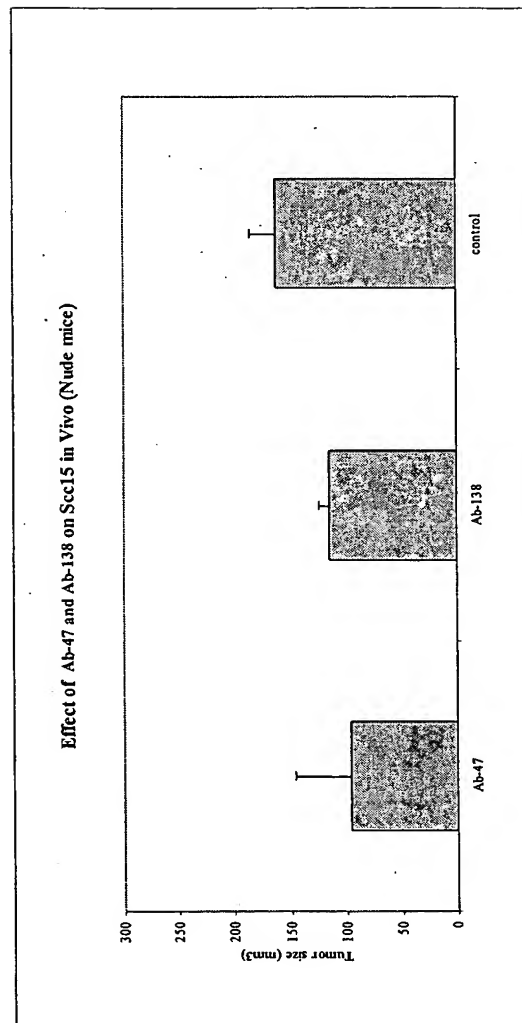
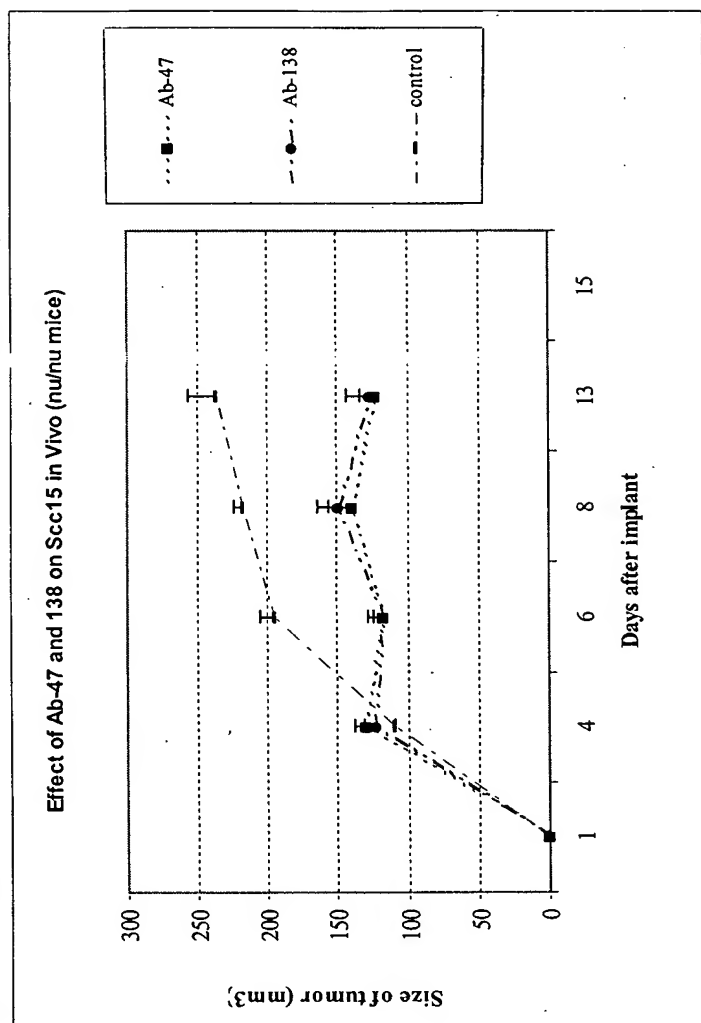


FIGURE 61 EphB4 gene

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Fig. 61(b)

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Fig. 61(c)

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8761 ccacggggcc cgtcccattt gagctgtca atgtcaccac tgaccgagag ggtgagactt
8821 ggggggtggg gcggtggtg gtctggcggg agagatgtca ctgagggcct ctgagggaga
8881 ggcaggggct gtgaagtgg gtaccccgga agtgtgaggg gctaaggctt tgggggcaag
8941 aggcagaaag agggcaatgg ctgggcgag tggctcacgc ctgtaatccc agcactttca
9001 gaggtgaga caggcggatc acttgagccc tggagttaa gaccagcctg ggtaacatag
9061 gaagatctct ctacaaaaaa taaaaatat agccaggcga ggtggtgcat gcctgtggtc
9121 ccagctactc aagaggctga ggcaggagga ttgcttgagc ccaggagtgc gaggtgcag
9181 tgagctatga tcgcaccgct gcatgccagc ctgggtgaca gagcagtgtg agatcctctc
9241 tcaaaataaa tgaataagaa agagagggtg aggagctcgt aaagctgggc tggagagtta
9301 agtacaggaa ggccccaggt gggactgggg ccagagagaa tcagaaggaa ttctcgaaac
9361 agccaggggg aaattgagac aagtgtagcc agcagaggaa gtgttggaag agataaggga
9421 catggccagg ctgatcacia ggtcaggagt tcaagactag cctggccaac gtggtgaaac
9481 cccatgtcta ctaaaaataa aaaaattagc caggcatggt ggtgggcacc tgtaatccac
9541 ttgggaagca accagaagaa ttgcttgaac ccaggaggcg gaggttgag taagctgaga
9601 ctgcgccact gcactccagc ctgggtgata gacacgact ccgtctcgaa aaaaaaatt
9661 ttttttaagt taaggacag agctaccatg cacaagggtt cctgtgtct ctgcctctca
9721 cagtacctcc tgcagtgtct gacatccggg tgacgcggtc ctccaccagc agcttgagcc
9781 tggcctgggc tgttccccgg gcacccagtg gggctgtgct ggactacgag gtcaaatacc
9841 atgagaaggt aaggccatcc cccagccctg ggggtgggtg gcaatgggtt gtgctctcct
9901 ggctgggaca cctgggttgc aggcacctgg caggcatttg aattccagct ctgccatgga
9961 ttccctgggc agccttgggt aagccccttg gcctgtctga gcctcagact cttcatctat
10021 aaaatagtta ctgtaatagt taccagcagc tggacacagt ggctgaggtt ggggtgcggtg
10081 gctcacgcct gtaataccaa gcactttggg aggtgagggc gggcagaatg cttgagccta

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Fig. 61(d)

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10141 ggagttttgag accagcctgg gcaacatggt gaaacttcat ctctataaaa aacttaaaat
10201 gggccggggcg cggtagctta cgcctgtaat cccagcactt tgggaggccg aggtggggcg
10261 atcacaaggt caggagtatc gagaccatcc tggctaacac ggtgaaaccc catctctact
10321 aaaaatacaa aaaattagcc aggcgcgggtg gcaggcgcct gtagtcccag ctactcggga
10381 ggctgaggca ggagaatggc gtgaaccagc gaggcggagc ttgcagttag cccgagatagc
10441 gccactgcag tccggcctgg gcgaaagaac aagactctgt ctccaaaaaa aaaaaaaaaa
10501 aaaaaaacg caaaaaatac ttaaaatgaa aaaaattaga ctgggcacag tggctcatgc
10561 ctgtaatccc ggcacttttg gagggccgagg tgggtagaac acctggggtg aagagttcga
10621 gaccagcctg gccacaagg tgaaatcccc gtctctacta caaatagcaa aatcagctga
10681 gtgtgttggc gggcccctgt aatcccagct actcaggagg ctgagacagg agaatcactg
10741 gaacccaagt gattctcgac ttgaggtcga ggctgcagtg agtcgtgttt gcaccattgc
10801 attccagcct gagaaagtga gaccttgtct taaaaaaaaa gaatgatatt atgaatacag
10861 cactaggttt gcatgcgtaa gttctcccaa aggcctcacc agttgcaagg caggctagtg
10921 atgggagtg ggggcgagg agggcgaggc gaagagcaac aggaacttgg gttccgggtg
10981 gacggccacc cactacctc tcccgagcag ggcgcggagg gtcccagcag cgtcgggttc
11041 ctgaagacgt cagaaaaccg ggcagagctg cgggggctga agcggggagc cagctacctg
11101 gtgcaggtac gggcgcgctc tgaggccggc tacgggccct tcggccagga acatcacagc
11161 cagacccaac tggatggtga gcctggggaa gggggtgagg gtgggggttg gaaagacccc
11221 caaagttcct gggaagaccc caggtctcca aagtcaccatc atcttttttt tttttttttt
11281 tttttgagat ggagtcttgc tctgtccctc aggcctggagt gcagtggcac catctccgct
11341 cactgcaacc tccgcctccc ggattcaagc cattctcctg cctcagcctc ccgagttagct
11401 gggattacag gcgcctgcca ccgcgcctgg ccgatttttt gtatttttag tagagacggg
11461 gcttcaccgc gttggccagg ctggtctcga actcctgacc ttgtgattcg cccgcctcgg
11521 cctcccgaag tgctgggatt acaggcatga gccactgcac ccggtcaaaag tcctatcttc
11581 atgtccttct tcctgtggat cacatggcat gccctagaga ggagagaacg taagatgtcg
11641 aaaccaaacc caacagctga gttttgtgaa gtctggcctg cttcactctg tacccccagg
11701 ctggagcgca gttgctcgat caaagctcac tgcacagcca ggcacagtgg ctcaccctgt
11761 aaccccagca cttgggagg accgaagcagg aggatcactt gaggtcagga gttcgagacc
11821 agtctgacca gcatggtgaa ccgcgctctc tactaaaaat atagaagta gctgagcgtg
11881 gtggtgcaca cctgtaatcc cagctactcg ggaggctgag gcaggagaat cgcttgaacc
11941 tgggaggtgg aggttgcagt gagctgagat tgtgccagtg cactccagcc tgggcaacag
12001 agcaagactc tgtctcaaaa aaaaaaaagc tcaccgcagg cttgactttt agcaacaacc
12061 tgacccctga gtcccccatt ccccatccaa caaaatggga atatcatgaa gcttcctgca
12121 gggcttttag gattggagggt aacagggttat ttttaatatg ctaggccagt ggctttcttt
12181 tttctttcac attttttttt ttgagacgga gtctcactct gttgccagg gtgagctcgc
12241 gtggcgcgat ctgagctcac cgcaagctcc acctcctggt ctogatctgc tgacctcctg
12301 atccaccgcg ctcggtctcc cgaaatgctg ggactgctgg cgtgagccac cacgcccggc
12361 ctaacttttt ctttttttta agagacacgg tcttttttat caccaggtct ggagtgcggt
12421 ggcaccatca tagctcattg cagcctacaa ctcccagact caaccaatcc ttccacctta
12481 gcctcccaag tagctggggc tataggcatg tgctaccgtg ctcaactaaa ttttttttta
12541 tgttttgttg agacagtttc cctatgttgc ccaggctggt ctcaaattcc tgacctcgag
12601 caatcctccc gcatcggcct cccaaagtgc tgggattaca ggcagagcc gccacaccca
12661 gcattggacc agtggctttc taaaccttgt aattttctgt aatagcttta ctgaaatata
12721 gttcccctgc catacaattt gcctgttcaa agtgtacaat cgatgacttt tgatacattc
12781 acagaattgt gcagtcacca ccacaagtaa ttttgggaca ttttcagcac cctcaaaaga
12841 gaccctatag cccttagcca tcacccccca cccagatctt tctgttgct tagtccctgg
12901 caagcactaa cccactttct gtcttgaaat cttccagtgt ggtcttttgt gactgttcac
12961 cgagcagaat gttttcaagg tttatgtatg ttgtagtata tatccgtggg tttttttggt
13021 tgtggtttgt tttttgtttg ttttggaaac agggctctcgc tctgtcacc aggctggagt
13081 ccatggttcc aattacagct cactgcagcc tcaacctccc aggcctcaag gatcctccca
13141 cctcagctcc ccaagcagct gggactgtag gcatgagcca ccatgcccag ctaatttttt
13201 ttggtatttt ttgtaaagac agggtttcac catgtttccc aggctggtct cgaactcctg
13261 agctcaggca atccaccac ctcagcctcc caaagtgtct tgattacagg catgagccac
13321 tggacctggc ctgttttttg tttttgtttt gaacacacga ttttgctttg tcaccagggc
13381 tggaatgtaa tggctctgat atagtgcatt gcagcctcaa actcctgggc tcaagcgatc
13441 ctctacctc agcctcctga gtatctggga ccacacgtgc tcaccacatc gcttggctaa
13501 ttattattat tttttgatag agacggggtc ttgctatgtt tcccaggctg gtcttgaaca

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Fig. 61(e)

| | | | | | | |
|-------|-------------|-------------|-------------|-------------|-------------|-------------|
| 13561 | cctggcctca | cacaatcctc | ccacctcagt | atctcagagt | gctgggatta | caggcatgag |
| 13621 | ccactgctcc | tggccaatat | ttcattttctt | tttatggaga | cgtaataatc | agttgtatgg |
| 13681 | aaatagctga | ttttgttttt | tattgtatct | tttggatgaac | atttcaattg | tatcgacttt |
| 13741 | ttggataaaa | acctgaaaat | gtttcacctt | tagaacgttt | cattgaatgg | agattttttt |
| 13801 | gtggactctg | gtattttatac | tagaaccaaa | tcaaaaccac | tctggcggct | gggcatgcct |
| 13861 | aggctggttt | gagactagcc | tgtccaacct | ggtgaaagcc | catctctact | aaaaatacac |
| 13921 | aaattagccg | agcatgggtg | tacacacctg | taatcccagc | tactcaggag | gctgaggcag |
| 13981 | gagaatcgca | gaacccggga | ggcggagatt | gcagtgagct | gagattgctc | cactgcactc |
| 14041 | cagcctgggc | gacagagtga | gactgcgtct | caaaaaaaca | aacaaaaaat | tactctggca |
| 14101 | gtaagaaaag | atttcgaaac | ttcctccctt | gccctgaggt | acttcagagg | agcctgctgg |
| 14161 | cccctggggg | agagtttgaa | acccactgtt | tgttccctga | ccttgccctg | ttgtgtcctc |
| 14221 | tccctccacc | tgtccctgt | actggggacc | tgttctcagg | agatcacagt | tcattgtctc |
| 14281 | aagccggggc | tggggcctcc | tacaggacca | tcagtttctc | ctgatcagca | gcctttcctt |
| 14341 | cgcagagag | cgagggtctg | cgggagcagc | tggccctgat | tgcgggcacg | gcagtcgtgg |
| 14401 | gtgtggtcct | ggtcctgggtg | gtcattgtgg | tcgcagttct | ctgcctcagg | taagggtctt |
| 14461 | gacacccaga | ggcccctgga | agccctcagt | tgatggccac | ctgcctgggt | gctacaggac |
| 14521 | aagcctttct | ggctgtcccc | agcctctttt | tacttgaaat | cttctccaat | ccctgtctct |
| 14581 | tcctttgggtg | tgtgtgcctc | ataaagatgt | gtgactcagt | ttaccttttg | ttcctttccc |
| 14641 | atcggctaca | ggaagcagag | caatgggaga | gaagcagaat | attcggacaa | acacggacag |
| 14701 | tatctcatcg | gacatgggtg | gttgccctaa | tttgatggga | ataggggctt | ggggcggggt |
| 14761 | gtggtggctc | ctatctataa | tcccagcact | ttgggaggca | gaggtgggca | gatcacttga |
| 14821 | ggtcaggagt | tcgagaccag | cctggccaac | atgttgaaac | tccatctcta | taaaaaatac |
| 14881 | atcagtcagc | caggcatggt | ggtgggcacc | tgtaatccca | gctactcagg | aggctgaggc |
| 14941 | agaagaatca | ttttaacccg | ggaggcggag | attgcagtga | gccaagatcg | cgccactgcg |
| 15001 | ctccaggcct | gggtgacaga | gcgagactcc | atctcaggaa | aaaaaaaaaa | aaaaaaaaaa |
| 15061 | accacggaga | caggggtttg | gggctaaaag | ctatgagccg | agcctccgag | tccagtggga |
| 15121 | gttaattccc | agctgacggg | gccttgccctg | atctctcagg | tactaaggte | tacatcgacc |
| 15181 | ccttcactta | tgaagaccct | aatgaggctg | tgagggaatt | tgcaaaagag | atcgatgtct |
| 15241 | cctacgtcaa | gattgaagag | gtgattggtg | caggtgagag | ccgaaggctg | cccgggcacc |
| 15301 | tgggaacgaa | gcgggggtgg | gcagggccac | actggagcgg | gagagctgat | gacctctgcg |
| 15361 | tccttgtttg | aaggtgagtt | tggcgaggtg | tgccgggggc | ggctcaaggc | cccagggaag |
| 15421 | aaggagagct | gtgtggcaat | caagaccctg | aagggtggct | acacggagcg | gcagcggcgt |
| 15481 | gagtttctga | gcgaggcctc | catcatgggc | cagttcgagc | accccaatat | catccgcctg |
| 15541 | gagggcgtgg | tcaccaacag | catgcccgtc | atgattctca | cagagttcat | ggagaacggc |
| 15601 | gccttgact | ccttcctgcg | ggtgagcacc | ctccctggct | tctgcgccca | cccagggttc |
| 15661 | ccacttacac | ccagaggcca | cttgggttaa | gaagccagga | cagacagttg | gtcccaggtc |
| 15721 | acctcctcca | gccttttctt | cttgggctaa | gccttggtcc | tctgcctttt | ctttttttta |
| 15781 | agacagagcc | tcgctctgtc | gcccaggctg | gagtgcagtg | gcgcgatctc | ggctcattgc |
| 15841 | tgtctccacc | tccagggttc | aagcgattct | cctgcctcag | tctcccaagt | agctgggtact |
| 15901 | ataggcatgc | accaccatgc | tgactaattt | ttgtattttt | agtagacaca | gggtttcacc |
| 15961 | atgtaggcca | ggctggtatc | aaactcctga | cctcaagtga | tctccccacc | tcagcctccc |
| 16021 | aaagtgtgg | tattacaggt | gtgaggcacc | acgcctggcc | agccctctgc | ctttaatttt |
| 16081 | cctctggga | aaggctgggc | tcctgggacc | ttcctttccc | actgccccat | acagctgaag |
| 16141 | gttgctattc | cttctttttt | tttttaattt | tgttttaatt | gaattttttt | tttttgagat |
| 16201 | ggagtttcac | tcttggtgcc | caggccggag | tgcaatggca | agatcttggc | tcaccgcaac |
| 16261 | ctccgcctcc | cagggtcaag | cgattctcct | gccttagcct | ccccagtagc | tgggattata |
| 16321 | ggcatgtgcc | accacgcttg | actaattttg | tatttttagt | agagacgggg | gtttctctgt |
| 16381 | gttggtcagg | ctggtctcga | actcccgacc | tcaggtgatc | cgccctgcctc | ggcctcccaa |
| 16441 | agtgtctggga | ttacagacgt | gagccacccg | gcccggccaa | tttttttttt | gtttttttta |
| 16501 | gacagagtct | cactctgtcc | tctaggctgg | agtgagtggt | tgcatctcata | gctcactgta |
| 16561 | gccttgacct | cctgggctca | agtgatcctc | ccgcctcagc | ctcctgagta | gctggaacta |
| 16621 | cactcatgta | ccaccatgct | cagcaaattt | ttaaaatttt | ttgtagagac | aggatctcga |
| 16681 | taggttgccc | aggctggtct | gaactcctgg | cctcaagcga | gcctccctcc | tcagcctccc |
| 16741 | acagcactgg | gattgcaggc | atgagccact | gtgcctggcc | tgtcattcct | tcttttgaca |
| 16801 | aatattttact | gagtgccttc | tacgcaccgg | tcatcctccc | agtccccagg | aataaagcta |
| 16861 | tacacacggc | aaactggatt | tctcctcttg | gggagcagag | ggtctaattg | ggcaggggga |
| 16921 | ctgaaaatta | gcaagtaa | agacaggctt | tttaaaaaag | taaacaaatc | atttcaaatg |

Fig. 61(f)

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16981 tgaaaaaaag caaacggggg ccttcatgca gatgtggcta gagaggaaag agaactgctt
17041 aattttatttg gtcacttttac cagatttttac tgactttttt ttttttttta actttattaa
17101 gctttttcttt tttcttgaga tggagtttcc atctgtcacc caggctggag tgcagtggg
17161 cgttcttggc tcaccgcaac gtccacctcc tgggttcaag tgattctcct gcctcagcct
17221 cctgagtagc ttggaattgc atggcatgca ccaccatacc cagctgatgt ttgtattttt
17281 agtagagaca gggtttcatc atgttgccca ggctgggtctt gaactcctgg gctcaagtga
17341 tccacccatc tcggcccttc aaagtgtctg gattacaggc atgagccacc atgcctggcc
17401 taggcatctt tttaaaaaaa tcaaaacatt tttctatgta gcaaaataac attgcattga
17461 acagagttaa agcgattccc tagcgtcatt gaataccagc ttgattttca cgtttctcta
17521 gttgttctaa agatgtcctt cactgctgct ttattccaac caggatccag ttcaagaccg
17581 ggctttgtac ctgggtatta tatatatttt atttatttat tttagaaaca aggtcttgcc
17641 ctttcgcccc gtttagagtg cagtgggtga atcatagctc actgcagcct ccaaactcct
17701 tggctcaggt gatcctcctg cctcagcctc ctgggtagct ggaactacag gtcacacca
17761 ccacacctgg ctaattttta aattttttac ggagatgggg gtctcgctat gttgccagg
17821 ctgggtctca actcctggac tcaagcgatc ctccctcctt aacctctcaa agtgcctggg
17881 ttacaggcgt gagccaccac gcctgctgat tattatattt tcgagcctct ctaaactctg
17941 agcagttcct catgatgaca ctgacacact gaagggttag gtcccttgct cgctgaatg
18001 tcttgatttc tggatttatg aaattcttct tatgggatca tttagcttgt ctctctgtat
18061 ttctgttaag agaagctcta ctgatgtgg ggtttttttg gttttgtttt tttgtttttt
18121 gagatggagt cctgctgtcg ccaggctgg agtgcagtgg cacaatctcg gctcactgca
18181 acctcgctc cctgggttca agagattctt ctgcctcagc ctctgagta gctgggacta
18241 caggcgagtg ccaccatgcc cagctaattt ttgtattttt agtagagaca gggtttcacc
18301 atattggcca ggatggtctc gaacttctga cctcgtgatc tgcccaccac ctcagcctcc
18361 cacagtgcct ggattacagg catgagccac tatgcccggc taatttttgt atttttagta
18421 gagacagggc ttcgccatgt tggccaggct gatctgaaac ccctggcctc aagccatcca
18481 ccctccttgg cctcccaaag tgctgggatt aaacgcgtga gccaccgtgc ctggctgaag
18541 agacagaaag ggtcttaaa gttcagtgac acacacctgt aatccagca ctttgggaag
18601 ctgaggtctg tggatcactc gaggccagga gttagagatc accctgggca acatggtgaa
18661 acccctgtct tacacaaaat acaaaaatgg gcagagcatg atggtgcata tctgtagtcc
18721 cagctactcg ggaggctgag gcgggaggat cacttaagcc tgggagatcg aggtgtagt
18781 gagccatcat tgcactactg cattccagcc tgggcgatcc catctcttaa aaagagagag
18841 agatgggaag accagcacag gtgaaactgg tgaacagagg agagatggta gatgctgcat
18901 tgggcagtgt gacgggaacc cgctggaggg ctttggcagg agagtattt aagaggatcc
18961 cagctgggca cagtggctca cacttgtgat ccagcactt ggggaggccg gggcaggtgg
19021 atcacttgag gtacaggagt cgagaccagc ctggccaaca tggtgaaacc ctgtctgtac
19081 taaaaataca aaaaccagcc aggcattggt gtgcaccctt gtaatcccag ctactcaggä
19141 gactaagaca ggagaatcgc ttgaactcag gaggcagagg ttgcagtgag ccaagatcac
19201 gccactttac tccagcctgg gcagtagagc gagactccat ctcaaaaaaa taaataaata
19261 aaaagacctc tttgctgggt gctagggagc aagagcagga gctgggagag gcctgcagca
19321 gaagcctgtt gccagcatcc aggcctgggg gtgaagggaa gggtttggat ttgggacatg
19381 tcttgggaag atcaccagca gaacttgctg atggattgga agtggctggt gägggagaaa
19441 agggggtcaa aggaaactct gaggtctata ccctgaccat ctggcaagtg ttggtgttgc
19501 cacaaaactga gcggggagta gggcaggtgc aggtctggag gatggattca aaattcagtt
19561 tttggagtct atgtccctgg ttctgtaggg ctgcagatgg tctgccaaat cttagcggaa
19621 ccagaatac gggatttgtt tactgtctgt gacttgttgg tttccctggg gagagcaaac
19681 tctttaaagg tcaagggttg gcttcagacc ttggtttttg caccgatcat tggtcatact
19741 gcagttcctc actcttctct tgcaaatcca tacacagcta gtccaagaga gctgaacagc
19801 tttgtggttg gatcagcacc aatgtatctc cacctgtaga cgggttgctc aggtgactca
19861 ttgctgtaat ccagcacct tgggaggcca aggtgggaag attgcttag gccaggagt
19921 ggagacaagc ctgggaaaac cagttagacc ccatatctac caaaaaaac cctttgtttt
19981 aattagccag gtgcagtggg gtgcacctat agtcccagct actaaggagg ctgaggcaga
20041 aggatcattt gagcccagga gtttaaggct gcggtgaacc atgatcgtgc cactgcactc
20101 caacctgggg gaaagaaaga gaccttgtct ctaaaaaac taaaaaacag aaaagcattt
20161 gttgagtatt tcctgggtat aaagcagtgt accaggttaa atggaaggaa aagttagaat
20221 aatttttcaa ctcataatcc gattgggaga gactgaatgc ttaccattga agcaggaacc
20281 attgtaagca atgtgtttg atactgtagc aagagctgag aaaacttggg aaaagagaaa
20341 ggaggaaggc tcacctgagg gagttggggg gcttgccta caggtgagtt gtgaggtggg

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Fig. 61(g)

| | | | | | | |
|-------|-------------|------------|------------|-------------|-------------|-------------|
| 20401 | tctggaagtg | acagatgcag | tttaggaagt | ggacgggagg | ctgggtacgg | tgactcaaca |
| 20461 | tctgtaatcc | cagtgttttg | ggagacccag | gcggaaggat | cgcttcaggc | caggagttaa |
| 20521 | agaccagcct | gggcaacata | gtgggaacct | atctctacta | aaaattaaaa | aattatccag |
| 20581 | gcataatggc | acatgcctat | tgttccagct | actcaggagg | cttgccctgag | cccaggagggt |
| 20641 | tgaggctgca | gtgagctatg | atggcaccac | tgcactccag | cctgggcgac | agaacaagac |
| 20701 | cctgtctcta | aaaaaaaaag | atgtggatgg | gagggggaac | ggtgggtggg | ctgtcctcac |
| 20761 | caagccccc | ccctatctgc | tctccagcta | aacgacggac | agttcacagt | catccagctc |
| 20821 | gtgggcatgc | tgcggggcat | cgcctcgggc | atgcggtacc | ttgccgagat | gagctacgtc |
| 20881 | caccgagacc | tggctgctcg | caacatccta | gtcaacagca | acctcgtctg | caaagtgtct |
| 20941 | gactttggcc | tttcccgatt | cctggaggag | aactcttccg | atcccaccta | cacgagctcc |
| 21001 | ctggtaatgc | tgggggtaat | actgggtgtg | agcttcttag | ggccagggtg | gcagggcagg |
| 21061 | ttggaaaggt | gggaggctga | gggtttggca | gccctgctcc | agggagagga | tacaggagca |
| 21121 | ggctgtgggt | ggggggacag | tcagctccag | gaagccgact | tccagatgtc | taggaaata |
| 21181 | acagttggat | aacctgggca | acatagcaag | accccatctc | tacaaaaaaa | ttaaaagatt |
| 21241 | agccaggcgc | agtggcatgc | acctgtagtc | ccagctactt | gggagggtga | ggcaggaggga |
| 21301 | ttgcttaagc | ccaggagtgt | gaggtctgag | tgagctatga | atgtgccact | gtactgcaga |
| 21361 | ctgggcgaca | gagcaagacc | ctgtctcaaa | agaacagtgg | ccagggtgtg | tggctcacgc |
| 21421 | ctgtaaatcc | agcacttttg | gaggtgagg | caggaggatc | gcctgagggt | aggagtccga |
| 21481 | gaccagcctg | gccaacatgg | gaaaacctg | tcgctactaa | aaatacaaaa | ttagctgagg |
| 21541 | gtggtgtgtac | acgcctgtaa | tccgagctac | tcaggaggct | gaggtaggag | aaccagttga |
| 21601 | acccgggagg | cggagtttca | gtgagccaag | atcgcaaccac | tgcactccaa | cctgggcaaa |
| 21661 | cagagttgga | gagtaggagg | cttggggcct | gagctagggg | gaaaaagcag | aggcagggtg |
| 21721 | gggactgggg | ggcagtgtgc | tgggtctggg | gagtccctca | gtgagtcccc | cagctcacct |
| 21781 | tttctccttt | ttctgcaggg | aggaaagatt | cccatccgat | ggactgcccc | ggaggccatt |
| 21841 | gccttccgga | agttcacttc | cgccagtgat | gcctggagtt | acgggattgt | gatgtgggag |
| 21901 | gtgatgtcat | ttggggagag | gccgtactgg | gacatgagca | atcaggacgt | aagtgtcccc |
| 21961 | tggtcttacc | aaactttcct | cgagtgttct | ctcacctggg | atttgggggtg | aagggtgggt |
| 22021 | tcccagagag | tcatactgc | tgggttcttg | agaccatgga | gatgacaaaa | aggagaattg |
| 22081 | atctttgtat | caaagagttg | agatacaggg | ccaggcctag | tggtcaagc | ctgtaatccc |
| 22141 | agcacttttg | gaggccaagg | tgggcagatc | acctaaaggt | aggagttcaa | gaccagcctg |
| 22201 | gccaacatgg | tgaacccccg | tctctaaaaa | aatacaaaaa | attagcccag | catgatgggc |
| 22261 | gggtgcctgt | aatcccagct | actcaggagg | ctgagacagg | ataatcgctt | gaacccaggga |
| 22321 | acagagggtg | cagtgtgctg | agatcacgcc | attgctttcc | agcctgggca | actgagcgag |
| 22381 | actctgtctt | aataaataaa | taaaagagtt | gggtacagca | tatttgggtc | gcagaaggat |
| 22441 | gcagagatgg | agggcagggt | tgagaggtaa | catgtctgta | tcatagcccc | agagctgctg |
| 22501 | gggccttcag | ccacagagag | cttcaactcc | ggctaggagg | attcctggat | ctgtattttt |
| 22561 | ttggggggct | gtggctccta | tcctaccatc | ttccaagtca | ccatttctctg | ggcctgttag |
| 22621 | catctttgct | tttcttgac | agcctcacc | agagcttctt | cccccttttc | cagggtgatca |
| 22681 | atgccattga | acaggactac | cggctgcccc | cgcccccaga | ctgtcccacc | tcctccacc |
| 22741 | agctcatgct | ggactgttgg | cagaaagacc | ggaatgcccc | gccccgcttc | ccccagggtg |
| 22801 | tcagcgccct | ggacaagatg | atccggaacc | ccgccagcct | caaaatcgtg | gcccgggaga |
| 22861 | atggcgggtg | aggactgcag | agaatgggcc | ctccttcccc | ctctctgccc | ccactccttg |
| 22921 | cccagaagtg | tccgttcatt | ggtgttgggt | gggagggcct | ctgtccgcct | ctgcaaggct |
| 22981 | gggttccacc | tcctcccccg | gacctgggcc | tggtaactcag | cattcctccc | catccttgcc |
| 23041 | ccctagggcc | tcacaccctc | tcctggacca | gcggcagcct | cactactcag | cttttggtct |
| 23101 | tgtgggagag | tggcttcggg | ccatcaaaat | gggaagatac | gaagaaagtt | tcgcagccgc |
| 23161 | tggctttggc | tccttcgagc | tggtcagcca | gatctctgct | gagtaagcag | tggcaggagc |
| 23221 | tggagtgggg | ctgggagagc | ggggcagctg | gagtcaggcc | cacggggctc | ccaggggctt |
| 23281 | ttgggggtcag | cttcgggtgc | caatgcgtgc | ttcttgcact | gcgctcatgc | catgcttaga |
| 23341 | agggcccccag | aggagcagtc | acagccccat | ggagctgagg | acccaaggac | tctttggggc |
| 23401 | cagcctgccc | gcctcacctc | ctcctgccat | cacagccctg | ggccatcgcg | cttcgccttc |
| 23461 | tcacttctag | ctatctttgt | gcactctatc | gcattccagg | cccggctctc | acggtaacaa |
| 23521 | tgtgtcaact | cgggttctct | ttttccaacc | ataaaaggag | aagattgggc | taggttttgg |
| 23581 | agatcctctt | cagcttttat | gtgaaatggg | tttatgatcc | cttgccctccc | aaaggctgcg |
| 23641 | tatccccact | tggcctttgt | ctgctactcc | ccctttctgc | cttcccgttc | ctctcccagg |
| 23701 | atctcctctc | accccagggt | gaataacaga | aatagaagga | atagaaatct | gaaggccggg |
| 23761 | catggtggct | catgcctgta | atgccagcac | tttgggaggc | cgagggtggg | agatcacttg |

Fig. 61(h)

```

23821 aggttaggag ttcgagacca ttgtggacaa cttggtgaaa ccttatgtct actaaaaata
23881 caaaaattag ctgggcatgg tgggtgcgtgc ctgtaatacc agctactgag gaggctgagg
23941 caggagaatc gcttgaaccc gggaggtgga ggttgcagtg agccgagatc gcaccactgc
24001 actccagcct ggatgacaga gtgaaattcc atctcaaaaa aaaaaaaaaa aaaaaaaaaaag
24061 aaatgtgaag gccaggtggt ggctcacgcc tghtaatctca gcactttggg aggctcaggt
24121 ggaccgattg cttgagccca ggagtttgag agcagcctgg ccaaaatagc aaaaccccat
24181 ctctacaaaa caaaaacaaa aaaattagct gggcatggtg gtgctgtcct gtggtcccag
24241 ctactcagga ggctagagcc agaggtgtctc aggccagtct gcccctgccc cacggggcct
24301 gggcacatcc ctccctaatt cttcccagcc tctctctgac ccagggggcc tctctccct
24361 tttttccctc tatctcagcc tccagccatc agcaacctcc tcttccctcc caccagctc
24421 ttccctctccc acttcggcct tttctttctc acactccatt tccctctacg gcaatctgtg
24481 cagcctcttc ccccagctctc attttgcggg cttttctctc ttttctttcc ttccctggca
24541 cccaagctaa aggcctgcc tctggcctcc agccctacct ccttctgcgg ttgcacagaa
24601 ggatggctgc ccagctctta aaaaaactgc ccgggaactg ttgacatctg ttctccctcc
24661 cccgctggct tttctgattg gcttacaatc ctgaggctag gaccgtctca ggagccaaga
24721 gaggagagcg gccacaggga acctagggtc tcaccaagct ctcccttccct tctgcaggga
24781 cctgctccga atcggagtca ctctggcggg acaccagaag aaaatcttgg ccagtgtcca
24841 gcacatgaag tcccaggcca agccgggaac cccgggtggg acaggaggac cggccccgca
24901 gtactgacct gcaggaactc cccaccccag ggacaccgcc tccccatttt ccggggcaga
24961 gtggggactc acagaggccc ccagccctgt gcccgcctgg attgcacttt gagcccgagg
25021 ggtgaggagt tggcaatttg gagagacagg atttgggggt tctgccataa taggagggga
25081 aaatcacccc ccagccacct cggggaactc cagaccaagg gtgagggcgc ctttccctca
25141 ggactgggtg tgaccagagg aaaaggaagt gccaacatc tcccagctc cccaggtgcc
25201 cccctcacct tgatgggtgc gttcccgcag accaaagaga gtgtgactcc cttgccagct
25261 ccagagtggg ggggctgtcc cagggggcaa gaaggggtgt cagggcccag tgacaaaatc
25321 attgggggtt gtagtcccaa cttgctgctg tcaccaccaa actcaatcat ttttttccct
25381 tgtaaatgcc cctccccag ctgctgcctt catattgaag gtttttgagt tttgtttttg
25441 gtcttaattt ttctcccgt tccctttttg tttcttcgtt ttgtttttct accgtccttg
25501 tcataacttt gtgttgagg gaacctgttt cactatggcc tcctttgccc aagttgaaac
25561 aggggcccac catcatgtct gtttccagaa cagtgccttg gtcacccac atccccggac
25621 cccgcctggg accccaagc tgtgtcctat gaaggggtgt ggggtgaggt agtgaaaagg
25681 gcggtagtgt gtggtggaac ccagaaacgg acgccgtgc ttggaggggt tcttaaatta
25741 tatttaaaaa agtaactttt tgtataaata aaagaaaatg ggacgtgtcc cagctccagg
25801 ggtgatgggg gtgatggact agatttctaa ggagagtggg gctgggtagg gagggctttg
25861 tggctgaccg agaggtgtca gaggtctgga ggctgcaggg ctgtaggggc tggaaacttg
25921 ttatcagccc cagggtatgt ttgaggtggt ggggtggggg ccgagcgaga tgaatcattc
25981 gcagctgctt ctaacgtctc

```

FIGURE 62. EphB4, mRNA.

```

1  ctccggcccg  cggcgcgagc  agagccactc  cagggagggg  gggagaccgc  gagcggccgg
61  ctcagccccc  gccacccggg  gcgggacccc  gaggcccccg  agggacccca  actccagcca
121  cgtcttgctg  cgcgcccggc  cggcgcggcc  actgccagca  cgctccgggc  ccgcgcggcg
181  cgcgcgcggc  acagacgcgg  ggccacactt  ggccgcggcg  cccggtgccc  cgcacgctcg
241  catgggcccc  cgctgagggc  cccgacgagg  agtcccgcgc  ggagtatcgg  cgtccaccgg
301  cccagggaga  gt cagacctg  ggggggcgag  ggcccccaa  actcagttcg  gatccctacc
361  gagtggggcg  gtcgcatgga  gctccgggtg  ctgctctgct  gggcttcgtt  ggccgcagct
421  ttggaagaga  ccctgctgaa  cacaaaattg  gaaactgctg  atctgaagtg  ggtgacattc
481  cctcaggtgg  acgggcagtg  ggaggaactg  agcggcctgg  atgaggaaca  gcacagcgctg
541  cgcacctacg  aagtgtgtga  cgtgcagcgt  gccccgggcc  aggccactg  gcttcgcaca
601  ggttgggtcc  cacggcgggg  cgccgtccac  gtgtacgcca  cgctgcgctt  caccatgctc
661  gagtgcctgt  ccctgcctcg  ggctggggcg  tcctgcaagg  agaccttcac  cgtcttctac
721  tatgagagcg  atgcggacac  ggccacggcc  ctcacgccag  cctggatgga  gaacctctac
781  atcaaggtgg  acacgggtgg  cgcggagcat  ctaccccgga  agcgccttgg  ggccgaggcc
841  accgggaagg  tgaatgtcaa  gacgctgctg  ctgggaccgc  tcagcaaggc  tggcttctac
901  ctggccttcc  aggaccaggg  tgcctgcatg  gccctgctat  ccctgcacct  ctctacaaa
961  aagtgcgccc  agctgactgt  gaacctgact  cgattcccgg  agactgtgcc  tcgggagctg
1021  gttgtgcccc  tggccggtag  ctgctggtg  gatgccgtcc  ccgcccctgg  cccagcccc
1081  agcctctact  gccgtgagga  tggccagtgg  gccgaacagc  cggtcacggg  ctgcagctgt
1141  gctccggggg  tcgaggcagc  tgaggggaac  accaagtgcc  gagcctgtgc  ccagggcacc
1201  ttcaagcccc  tgtcaggaga  aggttcctgc  cagccatgcc  cagccaatag  ccactctaac
1261  accattggat  cagccgtctg  ccagtgcgc  gtcgggtact  tcggggcagc  cacagacccc
1321  cggggtgcac  cctgcaccac  ccctccttcg  gctccgcgga  gcgtggtttc  ccgctgaac
1381  ggctcctccc  tgcacctgga  atggagtgcc  cccctggagt  ctggtggccg  agaggacctc
1441  acctacgccc  tccgctgccg  ggagtgccga  cccggaggct  cctgtgcgcc  ctgcggggga
1501  gacctgactt  ttgaccccgg  cccccgggac  ctggtggagc  cctgggtggg  ggttcgaggg
1561  ctacgtcctg  acttcacctt  tacctttgag  gtactgcat  tgaacggggg  atcctcetta
1621  gccacggggc  ccgtcccat  tgagcctgtc  aatgtcacca  ctgaccgaga  ggtacctcct
1681  gcagtgtctg  acatccgggt  gacgcggtcc  tcaccagca  gcttgagcct  ggccctgggt
1741  gttccccggg  caccagtggt  ggctgtgctg  gactacgagg  tcaaatacca  tgagaagggc
1801  gccgaggggt  ccagcagcgt  gcggttctcg  aagacgtcag  aaaaccgggc  agagctgcgg
1861  gggctgaagc  ggggagccag  ctacctggtg  caggtacggg  cgcgctctga  ggccggctac
1921  gggcccttcg  gccaggaaca  tcacagccag  acccaactgg  atgagagcga  gggctggcgg
1981  gagcagctgg  ccctgattgc  gggcacggca  gtcgtgggtg  tggctcctgg  cctggtgggtc
2041  attgtggtcg  cagttctctg  cctcaggaag  cagagcaatg  ggagagaagc  agaataattc
2101  gacaaacacg  gacagtatct  catcggacat  ggtactaagg  tctacatcga  ccccttctac
2161  tatgaagacc  ctatgagggc  tgtgagggaa  tttgcaaaag  agatcgatgt  ctctacgtc
2221  aagattgaag  aggtgattgg  tgcaggtgag  tttggcgagg  tgtgccgggg  gcggctcaag
2281  gccccaggga  agaaggagag  ctgtgtggca  atcaagacct  tgaagggtgg  ctacacggag
2341  cggcagcggc  gtgagtttct  gagcagggcc  tccatcatgg  gccagttcga  gcaccccaat
2401  atcatccgcc  tggagggcgt  ggtcaccaac  agcatgcccg  tcagtattct  cacagagttc
2461  atggagaacg  gcgccctgga  ctcttctctg  cggctaaacg  acggacagtt  cacagtcac
2521  cagctcgtgg  gcatgctgcg  gggcatcgcc  tcgggcatgc  ggtaccttgc  cgagatgagc
2581  tacgtccacc  gagacctggc  tgctcgcaac  atcctagtca  acagcaacct  cgtctgcaaa
2641  gtgtctgact  ttggcctttc  ccgattcctg  gaggagaact  ctccgatcc  cacctacacg
2701  agctccctgg  gaggaagat  tcccatccga  tggactgccc  cggaggccat  tgcttccgg
2761  aagttcactt  ccgccagtga  tgcctggagt  tacgggattg  tgatgtggga  ggtgatgtca
2821  tttggggaga  ggccgtactg  ggacatgagc  aatcaggacg  tgatcaatgc  cattgaacag
2881  gactaccggc  tgccccgcc  cccagactgt  cccacctccc  tccaccagct  catgctggac
2941  tgttggcaga  aagaccggaa  tgcccgcccc  cgcttcccc  aggtggtcag  cgccctggac
3001  aagatgattc  ggaacccgcg  cagctcaaaa  atcgtggccc  gggagaatgg  cgggcccctc
3061  caccctctcc  tggaccagcg  gcagcctcac  tactcagctt  ttggctctgt  gggcgagtg
3121  cttcggggcca  tcaaaatggg  aagatacgaa  gaaagtctcg  cagccgctgg  ctttgggtcc
3181  ttcgagctgg  tcagccagat  ctctgctgag  gacctgctcc  gaatcgaggt  cactctggcg

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Fig. 62(b).

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3241 ggacaccaga agaaaatctt ggccagtgtc cagcacatga agtcccaggc caagccggga
3301 accccgggtg ggacaggagg accggccccc cagtactgac ctgcaggaaac tccccacccc
3361 agggacaccg cctccccatt ttccggggca gagtggggac tcacagaggc cccagccctt
3421 gtgccccgct ggattgcact ttgagcccggt ggggtgagga gttggcaatt tggagagaca
3481 ggatttgggg gttctgccat aataggaggg gaaaatcacc cccagccac ctcggggaac
3541 tccagaccaa gggtgagggc gcctttccct caggactggg tgtgaccaga ggaaaaggaa
3601 gtgcccaca tctcccagcc tcccagggtg cccccctcac ctgatgggt gcgttcccgc
3661 agaccaaaga gagtgtgact cccttgccag ctccagagtg ggggggctgt cccagggggc
3721 aagaaggggt gtcagggccc agtgacaaaa tcattggggg ttgtagtccc aacttgctgc
3781 tgtcaccacc aaactcaatc atttttttcc cttgtaaatg cccctcccc agctgctgcc
3841 ttcataattga aggtttttga gttttgtttt tggctttaat ttttctcccc gttccctttt
3901 tgtttcttcg ttttgttttt ctaccgtcct tgtcataact ttgtgttgga gggaacctgt
3961 ttcactatgg cctcctttgc ccaagttgaa acagggggcc atcatcatgt ctgtttccag
4021 aacagtgcct tggtcatccc acatccccgg accccgcctg ggacccccaa gctgtgtcct
4081 atgaaggggt gtggggtgag gtagtgaaaa gggcggtagt tgggtggtgga acccagaaac
4141 ggacgccggt gcttggaggg gttcttaaat tatatttaaa aaagtaactt tttgtataaa
4201 taaaagaaaa tgggacgtgt cccagctcca ggggt

```

Fig. 63(a)

FIGURE 63. EphrinB2 Gene

```

1  ggcgcctcggg gctgcctcgg ggcgcacgcc gtcttccccg ccagtctgcc ccggaggatt
61  ggggggtccca gctgcgtcc cgtcagtcgc ttcttggccc ggagtgcgcg gagctgggag
121  tggcttcgccc atggctcggg gaagggactc cgtgtgggaag taetgctggg atgttctgat
181  ggttttatgc agaactcggg ttcccaaatc gatagtttta gagectatct attggaattc
241  ctccgaactcc aagtaagtgg cgtccgcgat cccctatgt cccgcgcccg gggtcgcgcg
301  cgccgtccgg gcgaggagg gggtcagtcg gcggggcctc ggagcctgtt tctggaacct
361  cggttccccg tccccaccc ccaacccccg cccatttca ctaggaggag actcctcgct
421  cggttttcca acccgagccc cgttggaacg gacggtctct ccgcctttcc tccccgaac
481  gctcccaggc gctaaaagct actatcggct cgggtgtcaa gtccgggaag gtgtccgatg
541  gcgatacctg accctctcct gttttcgagg acgaaggaca tggccacaat ctaggctggc
601  cggcacgcgc ggactggagg gctctggaga gaggcggaga tgctgcattc gcggggagcg
661  cgggcggcgt ggctcggggc ccgcgggcgg gcgaccgggg tggcaggacg ctggcagcga
721  agcgcgttct ggagagggga gcctggagtc gctacgctgc ccgcagagcc ctggagccgg
781  ggcgccttgg caccgcgcc ccagcccgag ggtgcgcggg gagctcgcct gcttcgcagg
841  agaactcggg cgtcgagccc ttctctccgc gccggggaga cgggccttag gcttctccct
901  gagggcccg cgcacctcgg cctcccgcct cgttcataag ccggtagccc cggagtatgc
961  ggtctcgatg gccgacctga ttgtaatgca ctctctataa aagcttaggg ccctgccag
1021  tgcagactgc tccgaagcc ttctccctcg ggacctggt aggaatggga tccctaggat
1081  cagatttgct cttaccggac tctacagccg ggagcgagcc aggccttggt gagagtaact
1141  ttcagtttgg gccaccagag tgcattcaga atttagaaaa tccatccat ccctaaatct
1201  gtgtggtcat aactcgtagt catctgggta ttcagtactg tgtatccctc tatttcgaat
1261  cacagccaaa acatatttta cagaatcttg gaattgtagt ctcggaagac ttggagaaga
1321  agtatgcaga cattagctgg tttctggaga aaacgtttga gatcagaagc aaaatcaatg
1381  gcctaattga agttgagcaa gttgggcctg gttttaggag aaaagaaatg ggggattgat
1441  ttagaaatca cgtcttaaag gagtgtgtgc attctcttaa aagtgtcaaa tttcaaattc
1501  actaacatgt taaccaagaa tcccttcagt aaagggcgca aaacgtcggg tacaaatcgg
1561  tttaaacaaa tgtttgtatg atgctagaag gcactttcaa caccgctcat acggagaagt
1621  tacttagctc tgccctcctc catgtagtct gctcttgcat ggattatatt tttaatgtaa
1681  attgttgtat ttgctgatga agtactggcg gcggcatctt tgcctcgatg ccggctcggg
1741  aggcgccagg tggtgccgga aggagccggg ctaggacctc gcgcagcagc gggtcocgga
1801  gtccgggaga ggcgggcggg cgggcgaggg ggtcgcgggg agcccgcggc gccgctgccc
1861  gccgggtgcc tccagaggtc actcttccat gcggaatcgc gcagcgccag gcctcgcccc
1921  tccccaggc cgctgctcc agccactctg cactttcact gaccggttct ctttgaggct
1981  gttttttttt ttcttatgag gatttaatat ttctgtttaa atctagttga aagcaattcc
2041  gttagcctct tcagcgttta gttcgggtgtg tgtatcttta tctttgcgct atattaacta
2101  ttagtttgtg tgtatccggg aggagaatta gaaataccta gttgggagaa aaagaaaagt
2161  agaacaatag ttatttcaac ctaaggttta gacgttaata acttcttttt gtaatgtgtc
2221  gagatggggg gtccctgggg gaggtgacag gtactacca cccccccc ccattctgat
2281  gatgaagatg agtctgtctt tccagctatg tccagacctg cgagggccct gcgtttctgg
2341  aagcctgccg tttgcgcggg tgaggttgct gctgctgtct tgcctccac agcagcattt
2401  cttttaaaaa tctcctgata acggcctgcc tggatgactg gataatgtgt gcctggaaaa
2461  ggtctccctt gcagctgaat gctagctcca gagatcagaa agatttcttc ctgtaggagc
2521  cataggaaag agtctctctt aagtttttga gaatgcatac aacccctga tgacaggggg
2581  tcgctttcct tggggaagtt ttatatattt ttccagagga aagtttgaat cggtaaatat
2641  gatgtggcag gaaggtaatc aaatgcattg aagtttcaca tcagttccta tgaactgtgg
2701  aacaattcat ttgtaatgaa gccgccatca gtaattagat ttgtttcatt cagaggtcag
2761  ctttttttagc aggtggtcga cacagggagc atgcagcagc tgtttgata cagggtccag
2821  aaaacccttt gtaaattcag cgtctccgta actactttaa tcacattgtc ggctctcccg
2881  tccctgactg tatgtaataa tggaaagatg tcctgcgtgc tgaaacagta gctgcctgt
2941  taggttattc acattgcttt gatacgttct ggtagagttg ggtccgttgt agccattttg
3001  gttgttttaa gttttggttt tttttttgtt ttttttttaa ttcagcagag aacagtaatg
3061  cctagcttcc gtttttaact taacacttca gtagaacatt ttcttccaag agggagattt
3121  tggcctaagt aaagtagtgg gctctttttt aaaaaaaaaa taattttact ttaatgtgag
3181  caaatctgta ttggtatggt gttctgcaat gcattacact gactttgaaa atttcgagta
3241  ctaatgcctt atgtctgggg ttaccattcc ctgtgcatca catactagtt agttaacata

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Fig. 63(b)

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3301 gcatttttgc tttcccatgt aattttttcc ctatataata ctggattcct gataactaatt
3361 gacttgatac aaaagaatgg ctggatgata tccagataac gtataataca tgggcttcac
3421 cacaatcagg ctctgaataa atacagacct gtcagagatt gataaaaataa actacaatgg
3481 atagtgtgtg ttaaacagtc cattcaataa catatataag ccagcctgcc ttccattgtg
3541 tctgaaattc ttatttttgt aggtaaacaa atgcacattc agcactgatt gaatagcccc
3601 ttgaactatg ctccacagtt tgcgtttggg ttaatcttgt cggttttaat atagagagaa
3661 aaaagctcaa agcaccaggg gtggaattgt tagtgctttc acatccacat tccctcacatt
3721 ttgtcaggat gataaactgt aggtaatgga ctgtcgttgt tctgcaggac aactgagcca
3781 ggcagagcac aaagactaag ctaaaagcat acctcacaac atgcttggta gccttctttt
3841 cagatgagaa tttatttgag aatcatgtgt ctagggaactg cacatcttaa cctcaacagt
3901 tacagcttca agccccagaa acaggagctg gaggttaaga tgatttgcta agcacctggt
3961 tctaaatctt ttacaaagca taagctgttg acgctgggtc tgccgacgca aagacatgca
4021 gatgactcca acatttccag aggccttctga cttaaagctaa agtgtgtgga cagggtgaatt
4081 cgccatgggc ctgggagacca gcttgctaaa aactatgtgt ttgaatggtt cctccagaca
4141 gagttagctg aagaacaatt ggtggattta tattaataacc tcttgcttgt aaacttactg
4201 aggtgcatcc ttcggttggt ggatcagtga gataattgcc ttcagatgga cattgcaact
4261 ggagcaacta aatccttgct gtctttcctt cctctgaaat ctccaggta gctcccgaga
4321 gcttcagtat gacaccaaac ttcgggcgac gtttttagagt gcgttcacct aatgggaaac
4381 tattcgagat ccagcgtga ctgcagtaat gcgtcatagg aatgggagtg gcagggaaa
4441 aggaaataca cttgttagac cctaataaaa aaatttttag gaaagatatt tctttacgt
4501 tttatgagaa cttcattctt aaaatactta attgcaaatt agacaaatag aagtgtctct
4561 ctaaggaagg tgattaaact ggtcctccta tcagcctaatt ctctgcctgc ctttgctgct
4621 gacataaaga acctgttttt caggtcactt aatatacatc tacatagatt tgcttatgag
4681 ctcacccttt gtgtagcggg gtagagcctt aaagaggagt gctcaactgt ttaaaatatt
4741 ttgattaaaa tatgcagaac ccatagaact ataagcttct agtcaggaat tagctctttc
4801 agggaacagc tcccccttc tttttaaggg gggaattaga aggaggctgg gggaggaata
4861 taagaacagc aaagaaggaa ggatagcaaa tgggacatgt tccgaacagc ttggaaaaac
4921 tcctgtggct tcattgtctc tataaagcca aagaatacaa agacataagc aattcagccc
4981 ttctcccatg atggaagatg taaaccgttg acatgcctcc cctgtttaac ttgtttaatt
5041 ctcattttaa attcagcacg atactagccg tgtgaactct gaagatttct ttagtaatcc
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5161 taggcaaatc aaccctggtc atagttaata aggggattac aactcagact aggtctttac
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5281 gtaaaaaggc atagaaaaac tagcagcagt aatctgattg tatggcaata aaaccaccat
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5641 gtagatttca ttgactgcct tttttataga ttgagattgg ggctgattaa aacttcagat
5701 cactgcagtt gttagggcct gggagatttt cctttttaac tccctggccta acagcagcag
5761 cgtttctgta ggattaactg cacttcgcgg tcgttgccct aatctatttg ggcttcaggc
5821 agggacatgc tgggaaggaa cagagaccag aggggatagg tagggctggg gttatctgaa
5881 aagaaaacag agaccttttg atttcagcca tcttttcaga ccagctccc tctccgctg
5941 catgggagaa gcaaaggtaa acaggacaca ttgtccctct cctcagcca cagagctctt
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6061 gggaggaatt tagttttaat tcaaatgagt agtaatccaa tatgccaaaa gcagtggtct
6121 ctacctagat gtaattttac tcgtaaatgt gagtcttaaa ctttgagttg aatggggcag
6181 gctgttagag gtggtgtaaa ttacaggatt ataaaaatgt tagtgctgcc cagccttaaa
6241 gtcaaaaaca gaaaaatctc tgtgctgttg agtcttccc cctctctcc tgaacaacct
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6361 aataagccat tgaaaccacg attgggttcc atgcagagtg acatccgcaa tcgggtcaag
6421 ccagaaggaa atacttgctc gattgcccc tatttgcatg tacaggaaag tctccacact
6481 ttggaagagt ctgaactctc aagacattga aaatgccaaa ggctgcaaac accctgtgtc
6541 tttcttgatg gagtgcactc tggtgtgttt tacaaggggg aattcagtg tgtttttttg
6601 ttgtgttgtg tgtttttttt ttttaaagag cagcataggg ccttctaga ctcttgatt
6661 ctgtgtctga caaaaatggt cattaaattg gcaatattat aatttagacc catttactg

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Fig. 63(c)

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6721 attttgttcc aaattctcaa ctgacttgag catctgtttg gggctgtaga tacattgccc
6781 ttgttgactg tttttctcgt ttctatggga attactgtag ccattactat gtagctttca
6841 tagactcaaa acattttttaa agtattgcat ataggctggc catatccagt gcctgttact
6901 ttaccttctt tttctaactt aatgcagcag tctgtattaa cagatccatt tcatttgtct
6961 agcttcatca gagagaggct acccctgat ttacaggctg ctcacatcca agcaccttgc
7021 attctacact tgacagtgat tgctaattggc ccattcaact aaagtatttg cttgttaaca
7081 gggaacagaa catgataaat gtccagcagg cttgtgcctt ccttcagctt ttcaaacgca
7141 gactggtgca tatttatggc aggcaaatga caaaagaaaa agctgaattg ccctggcctc
7201 cagctttcta tcagaaacag ggttaaagtg attaaagcaa tcattcaaga aagccctgcc
7261 gtttgtttac taaccttcac ccaacattta gctttgtagt ctacctgtga gaagatattt
7321 cagaagtatt agagataagg aaggaggatc tagcaaacca gtgaaaagag taggtgacca
7381 gttataaaa gctttccatg cacattgaat gccaggcgaa cctatttctg ttattccagc
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7561 agaaaacata gcaagggaaa gctccattaa acaagttgtt tctgccctta gtaattctct
7621 aaacaagata ggaagaaaaa gtggacagta gtggagtatt aatagtgtgc tcttttcatt
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8521 aaaatggatc attattataa tggactgtcc agtaaagttc atgatttctc ctagacatgt
8581 tctctctctt tatgacctag atcaagagtg atctctttaa gtctttctt cataatcca
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9961 tgtattttaa gagctaagct ccgtgattgg cacaatgaac caatcaatca aacaccagtt
10021 gttattaata aaagtcagtt gaatatgtac tgtgtgctg gccgtgggtc aatttgcctt
10081 tgcatacaag gaaaaatta aaatactctg ttaataaaga ctatagcata atactttcac

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Fig. 63(d)

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10141 cttaaacttc ttgatgttaa tttattttgt ttacctgcca aacttctact cattccttat
10201 gactttctgc tacatgaaac accctttgtt attcctttgt cctattaaat taagttctct
10261 ctccctctgct ttctctgcttt tgggtgctttc taataacact tttaaacctg gaactttctca
10321 ttacagctgtg caactgtgga ctgagaggag gctcctttgaa ttcattttgt atattctagt
10381 agagagtact gtgagcagtt gggttgttga atgaatacat taattcaacc tggagggtg
10441 ggcagtattg cattttttac atttgatatta catgatattt agaaaactgc ttaactgggtg
10501 gacgttgttt tattaacagc attttgtgta tagcactcac tatgtgccag ctgctattct
10561 aactgcctga caaatactcc tgaaaccttc atggtaacca tatgagggaa gcacttttaa
10621 tatatccata ataccaacgg ggagactgtg gccaaattgg ttaattaact tagccaaagt
10681 catattgaac taataagtgg atttaaaccg agctagtctg gggccagggt ccctctttta
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10801 gcatgcattt gcttaaagca gtgcatacat gatggatcaa aaagtttgtg gtataattgg
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11161 gagatccatt tgggtgagatg ctgagtgtgt gtcaagctaa ggagatagta tgacatcttt
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Fig. 63(e)

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16741 ctaatttttt tattttttgg agacggagtc ttgctctgtc acccaggctg gagtgcagta
16801 gtgcgatctc ggctcactgc aacctccgcc tctcggtatc aagcaattct ctgtctcagc
16861 ctccgagtaa ctaggactac aggcgccgcg caccatgccc agctaagtgt tgtattttta
16921 atagagacgg ggttttacca tcttggccag gctggtcttg aactcctgac ctctgatcc

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Fig. 63(f)

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16981 acccgccctca gcctcccaaa gtgctgggat tataggcgtg agccaccacg cctggcaaca
17041 taaggactat tttttaaaagt ttttacaatt atgactgtga agttgaaatg tctaaattat
17101 tagagatcca gtttagatta ctaaataatt atgtctaatt gagatgatta gacttagcca
17161 aagttccat gtagaagtat tagagtctag attggtgaaa aacttgaaaa agcttggctt
17221 aagttcaata ggtaatccaa gagtaaaaac agattccaat atcagatctt ttcaccatag
17281 tcatgttaag tttggaagcc ctacttgagt gtttccagtt ttttccacat tatattgtgt
17341 ctatatttga ttcaaaggca gggcatctat tgtcttgctt aggactgatt cactgggaaa
17401 agccactgga gttgcctatt tccactcagt atgcctcact cttagagtag cttcccatgg
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17521 tcctgaacct ggagattgtc ttgatggaaa ggaagaggca gccttccctt cccaggaaga
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17641 actgtgtggg acatgaatca ctcttggtgg tctttgcttt ttatttgggc ttaaaatcag
17701 cagactttat taaatgacac ctctctctaa ccactctctg tctgggcgaa gtttaacaag
17761 aacagcctcc ccccatgtgg tatgggttgt aactgtggcg gtttccctct gctgtttttg
17821 gttacaagat gaacattatc tgaacacaca gaaagaaatc tgtatttggc atccataatg
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18121 ggaactcaat tttttccat taaaaatga tactattagg aaactcacc cttttctttt
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Fig. 63(g)

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20401 aggcaggaat tgactcctgg tgtttgtaaa ccttaaagat gtccataaaa ggtcaaggaa
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20521 tttgtactta ctgcccggca tcttgccctga ggtttttaac ctccagcagca catcagaatt
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Fig. 63(i)

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30361 cctcaagctg gagtgttaatt gatctcatta cagaggagcc aggttggtg acagttgtgc
30421 tttgcaagtg gttttttgca ttggtgaagt agccattttt gttgttcctg atgttaaaca
30481 ggggatgaag gtattctttt attggcacia acgcgggaaa ttgctctgga ttcttagagg
30541 atagaacatg tcccctggac ggaataaggt tcatgtgtag ggcaaattta gataggggca
30601 ccttattggg gtactactg gtctctagat ggtcaaagca aacaacatgt ccatctaagc

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Fig. 63(j)

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30661 tgtgatgtcc atctaagctg tgtgtgtcca tgagagtgc gcattttctc ctctgcagtg
30721 ttgttatatt ctaaaactgtc agcagacatt aattcggtcg ctgggtgaagt cccaccgcct
30781 agagatgaac tctgcctccg atggatgttt tccacttcag tgccactcgt ctcgcaatta
30841 ctgggtcatt aatatcattg catgcaatta gtgacagtag aaagagctag aggggtgtgg
30901 gatgtgcacc ctccccacca tgaacttttt actctgaccc tttcccagct agaccttttc
30961 gtatcttggc aaggatattt taatgattga gactgtcaga atcttcagag caggcactgg
31021 attatgtgct ggaaataaatt cactcaaaca cctgcttctc catggttcag aatattttca
31081 ttagatatta tcactatccc ttccctggga agtttcattt ttaaaaatct gatgcttaag
31141 tacagctaata atagacaata ggggaattatg ttttatcttt agaactctta cattattctt
31201 ttctttaaaa atgtgagctg agtcattgct attgcagtgg tcatctggcc gcctattttt
31261 aaaacacaat tcctctatct tagtagattt tggcccatat taagcatatc aagaatgact
31321 tttttttttt caagacatgg ggttttattg ggggcttata tacaaggaaa gagagagtcc
31381 agtggcagtg ggctggacaa gatattccaga tggccctgtg gcagtgaact gggcaggaaa
31441 actgcaactg ctgtcaaaca ccatgtatgtt catctatagc attttcactt aacaccaccc
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31561 gtacggccca tgttccacag gatgggcca gggctcagct gttcctcata gacaaggaat
31621 gactctccac attggccact cccggattcc cttagctcagg acacatatct aggtgtgtct
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31741 tatattaagt ttttctgaat tactgtggca ataagaaacg gtcccttaaa ttatactaga
31801 agaaaagctt ttttttgtt ttgtttttta ttgtgaaatt atgttaaatt tttttctta
31861 actgagagct tccacctgca taaatcgtca taacttttaa cagtaagatc tttagacttag
31921 aaagtgatgt ttttctcaa cagaatttat taaaaatcaa gacaccaagc tgttccaaac
31981 aatagtttga ggggaaataa aataaacaac tccataaata atcttatgtt gttaaacatg
32041 tctctagcaa aacaaacaaa caaaaaagtc ggggggtggg ggaggtgcag tttattgcca
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32161 tttcttgatc tataccccct atgtgtacat gtgcttgcac gcacacacat gtagacacgc
32221 acacatgtgc acctgccatc actttctgct ctccgctctt ttcaactctg agtgtctgta
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32701 gaataattga aattaaagaa ataaaactgt accattttct ttaagagcat ccaattgtac
32761 ttgataacat cttcagtcac atttcaatgc tggcaaagag gaggggagtt ctaaactgtg
32821 actcaatttt agaacttact ttttccaaat tattctgttt agtgcagaaa actaattaat
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32941 ctgctttaag ttttcaaaac acaaccatag caatgtggta ttaattcaag tgattcttcc
33001 tatcatattg aacgatattt tcacgggtga aaaactcaca catcctacat cactgatagt
33061 ttatacagtg ttttagctgt ggctccctgc atgcaaaata agagttaatc aaatgtcagt
33121 gagaaccatc tcatcaagta gagggcttgt tttgtttaaa ttaactttgc taagtataaa
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33241 tttgggaggc cgaggcgggc ggatcacgag gtcaggagat cgagaccaa ctggctaaca
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33361 tgtagtcca gctactcggg aggtcagggc aggagaatgg cgtgaacctg ggaggcagag
33421 cttgtgggtg gccaaagatc caccactgca ctccagcctg ggtgacagag cgagactccg
33481 tctcaaaaaa aaaaaaaagg aaaataaatt ctctgtatt tttctttctt caagtgaggc
33541 catttagggg aaagtatacc ataaaacttg ctctaagata aggcaaattt ggtattatag
33601 gatgaagtgc tatgtgattt gaagtaatgc tgaatttttt aaatatatta aactaaacaa
33661 gaataatgag gccctcgga agtcatgatt atatttctca tttttctcat tttaaagcca
33721 cagtgaaaaa cacataaaag gaagaagtta gaaaaaaaaa tgaatgaaat tcttttttct
33781 cttttggcaa attaaataga tgtttctgtt tcagaagatt ttattaatta actttaaaga
33841 aacagtcatt ttttttggc attcagtga cactatcatt tccatgttta gaacttttct
33901 tctaagttag catcttaaaa gataactgtg aaactcaagg cattcaacta cattaatttg
33961 agtttcagaa attgaattct tgtttctaga gtacatagtt tgaattgatg tcagggtgtt
34021 aaatagataa atcttagctt cctaggttgt atattcacac taattatttt tttatcagcc

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Fig. 63(k)

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34081 ttcttatttt tcaacttacc ttattctttt tgtttttttg acactcagat ttgatagccc
34141 tgtggtagaa gaaaacagta atacagtttg gtttgttggt gtgtttgtgt ttattttaaa
34201 gtcacggctt tgctttccat gttgttactg gattatgctt tttttaattc ttcagtttgc
34261 caagataaca gtcttccgat cttcagaagt ctgtatcaag ctttaaggaaa ctgatgtgta
34321 ggaagactcg cctaagaagt ccaaattagc aaggctagca tgtgaggaca tgctggaaaa
34381 gaatagtccc catagatatt gacagagaat gttcataaaa tgctacttgt tttgtggtta
34441 catgagagta acttgtgtcc agtgcagctg tatgtaaggg caacgttttt attctgacga
34501 ctctgtgggt ttcatgaccc tggatgctta tcatgtctct ctgttggact tcttcaacgg
34561 agttgatata aatacttgct tccaagtgtc catctgccct ctccctccatc ctggccccat
34621 acaaatacgc tacattttta aataatttga aataccctca atagtattta tatttctctg
34681 tgcttcattc tttccataag aactgtgata ccattattct gtaggatttt tttgtgcttc
34741 cccgtttcac atctctgtgc cagtgcagcc catatatcgg tgcaaataca gaagtttgat
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35941 atcaagtata aaatagactg aagtcatttt gaattacgtt atacttgtaa agtttacctc
36001 ctggagtttc agttagtacc agtgtactaa ctgggttaaa acagttcatg gcaccttaga
36061 tcatttctaa ctcatggcaa aaatctttcc tgggtggaacg tgtaactgta ttttaaatgc
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36181 tatcttccag taccctttgc aagtcacagg ttgacttaaa aggaaaagaa gcaaaatgct
36241 gaatatagca gaaaaactgt ctgcattcag actgttcagc ccacttttgc tccccacgtg
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36661 attaaaagaa aaaaaaatca aataatgtgc acctcttgtg ctccagttt gacaaagcag
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37261 gctcatagaa actcatagtt tgaagcctct gggaggaaaag gatactttta aatttagtca
37321 catatttgga ggagggaaaa gggaaagagc agaatgaaga actgaaaaaa atcacacacc
37381 ggggcctgtc gtgaggtggg ggactggggg agggatagca ttaggagata tacctaagt
37441 aaatgacgag ttaacaggcg cagcccacca acatggcaca cgtatacata tgaacaaac

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Fig. 63(I)

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37501 ctgcacgttg tgcacatgta ccctagaact taaagtataa taaaaaaaaa ttttaatagc
37561 cccattaaat aattaaaaag atttttttta gattcacaga agtgtacaaa attttttaggt
37621 tttttttttt ttaagctgtc tgcTgaatag tttcttaatg gtctacaatg tttgtatcta
37681 caaacagata ctgtctgctt cttactaccc ttccaagaca agtattatta tggcaattat
37741 tgcccagttt cccgggaaaa atttatccac agttacagaa gaatgagatg caattgtgag
37801 actgtaaagt ttaagcaagc actcagagaa gcacagtgat atgtatgcac agaagaggca
37861 gtctttgttt tgaggaaaac agtgaaagta aagttaattc aagaccacaa agacaagtaa
37921 ataagtgcct tttttttgta gttaataata tttcagtggg atgcatattt ctaccataaa
37981 tgcatataga acttgtttgc tgacctactg tttggaaaac aaacaatccc attagaagaa
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40861 agttttgtat taggattgtt gtgtgcttgc ttggctgttg tgcaaattha tegtctgcag

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Fig. 63(m)

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41041 ttttttagtg cttaacattt gggctggcag tctgttcggt gtgagagttt ctgctgcctt
41101 ccaaataatat ttttaagtgt aatcaaataa tacagacgag ttacgagctg aacattttcc
41161 caggccccct cactccttcc gcgttcccgga gctgttctgt tctgccagga ggcagggtc
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41281 aagagcaata ccacataaac gctcaccgct gacctggaga attggccact tccctttttc
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41521 agacgaggta ttggcgaggc aaagtccagc ttctagttag taataagcct ggcttatttt
41581 tcacattttt aagggtcata aaagcagttc gtctgcactg ggacagcagt aactatctct
41641 gaccttttct gtctccgcgt ctgcaggttc tagcacagac ggcaacagcg ccggacattc
41701 ggggaacaac atcctcggtt ccgaagtggc cttatttgca gggattgctt caggatgcat
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41941 ggacagcgtc ttctgccctc actacgagaa ggtcagcggc gactacgggc acccggtgta
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42481 taccggactt gtcacacgga cctcgggcta gtttaaggtg gcaaagatct ctagagttta
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43861 catcatatat ttaacaatga caagatgttc cggcgtttat ttctgcgttg ggttttccct
43921 tgccttatgg gctgaagtgt tctctaga

```


FIGURE 64. EphrinB2, mRNA

```

1  gcgcggagct  gggagtggct  tcgccatggc  tgtgagaagg  gactccgtgt  ggaagtactg
61  ctgggggtgtt  ttgatggttt  tatgcagaac  tgcgatttcc  aaatcgatag  ttttagagcc
121  tatctattgg  aattcctcga  actccaaatt  tctacctgga  caaggactgg  tactataacc
181  acagatagga  gacaaattgg  atattatttg  ccccaaagtg  gactctaaaa  ctggtggcca
241  gtatgaatat  tataaagttt  atatggttga  taaagaccaa  gcagacagat  gcactattaa
301  gaaggaaaat  acccctctcc  tcaactgtgc  caaaccagac  caagatatca  aattcaccat
361  caagtttcaa  gaattcagcc  ctaacctctg  gggcttagaa  tttcagaaga  acaaagatta
421  ttacattata  tctacatcaa  atgggtcttt  ggaggggcctg  gataaccagg  agggaggggt
481  gtgccagaca  agagccatga  agatcctcat  gaaagtggga  caagatgcaa  gttctgctgg
541  atcaaccagg  aataaagatc  caacaagacg  tccagaacta  gaagctggta  caaagggaag
601  aagttcgaca  acaagtccct  ttgtaaaacc  aaatccaggt  tctagcacag  acggcaacag
661  cgccggacat  tcggggaaca  acatcctcgg  ttccgaagtg  gccttatttg  cagggtattg
721  ttcaggatgc  atcatcttca  tcgtcatcat  catcacgctg  gtggtcctct  tgcgtaagta
781  ccggaggaga  cacaggaagc  actcgccgca  gcacacgacc  acgctgtcgc  tcagcacact
841  ggccacaccc  aagcgcagcg  gcaacaacaa  cggctcagag  cccagtgaca  ttatcatccc
901  gctaaggact  gcggacagcg  tcttctgccc  tcaactacgag  aaggtcagcg  gggactacgg
961  gcaccgggtg  tacatcgtcc  aggagatgcc  cccgcagagc  ccggcgaaac  tttactacaa
1021  ggtctgagag  ggaccctggt  ggtacctgtg  ctttccaga  ggacacctaa  tgcctccgat
1081  cctcccttga  gggtttgaga  gcccgcgtgc  tggagaattg  actgaagcac  agtccggggg
1141  gagagggaca  ctctcctcgc  gaagagcccg  tcgcgctgga  cagcttacct  agtctgttag
1201  cattcggcct  tggatgaacac  acacgctccc  tggagctggg  aagactgtgc  agaagacgcc
1261  cattcggaact  gctgtgccgc  gtcccacgtc  tctcctcga  agccatgtgc  tgcggtcact
1321  caggcctctg  cagaagccaa  gggaagacag  tggtttgtgg  acgagagggc  tgtgagcatc
1381  ctggcagggtg  ccccaggatg  ccacgcctgg  aagggccggc  ttctgctggg  ggtgcatttc
1441  ccccgagtg  cataccggac  ttgtcacacg  gacctcgggc  tagttaaggt  gtgcaaagat
1501  ctctagagtt  tagtccttac  tgtctcactc  gttctgttac  ccagggtctc  gcagacctc
1561  acctgagacc  tccactccac  atctgcatca  ctcatggaac  actcatgtct  ggagtcctct
1621  cctccagccg  ctggcaacaa  cagcttcagt  ccatgggtaa  tccgttcata  gaaatttgtt
1681  ttgctaacaa  ggtgcccttt  agccagatgc  taggctgtct  gcgaagaagg  ctaggagttc
1741  atagaaggga  gtggggctgg  ggaaagggtc  ggctgcaatt  gcagctcact  gctgctgcct
1801  ctgaaacaga  aagttggaaa  ggaaaaaaga  aaaaagcaat  taggtagcac  agcacttttg
1861  ttttgctgag  atcgaagagg  ccagtaggag  acacgacagc  acacacagtg  gattccagtg
1921  catggggagg  cactcgtgtg  tatcaaatag  cgatgtgcag  gaagaaaagc  cctcttcatt
1981  tccgggggaa  aaagacgggt  attgttgga  aaggaacagg  cttggaggga  cttggagaaag
2041  taggccgctg  atgatatatt  cgggcaggac  tgttgttgta  ctggcaataa  gatacacagc
2101  tccgagctgt  aggagagtgc  gtctgctttg  gatgattttt  taagcagact  cagctgctat
2161  acttatcaca  ttttattaaa  cacagggaac  gcatttagga  gaatagcaga  gagccaaatc
2221  tgacctaaaa  gttgaaaagc  caaagggtca  acaggctgta  attccatcat  catcgttgtt
2281  attaaagaat  cttatctat  aaaaggtagg  tcagatcccc  ctccccccag  gttcctcctt
2341  cccctccgga  ttgagcctta  cgacactttg  gtttatgcgg  tgctgtccgg  gtgccagggc
2401  tgcagggtcg  gtactgatgg  aggctgcagc  gcccggtgct  ctgtgtcaag  gtgaagcaca
2461  tacggcagac  ctcttagagt  ccttaagacg  gaagtaaatt  atgatgtcca  gggggagaag
2521  gaagatagga  cgtatttata  ataggtatat  agaacacaag  ggatataaaa  tgaaagattt
2581  ttactaatat  atatttttaag  gttgcacaca  gtacacacca  gaagatgtga  aattcatttg
2641  tggcaattaa  gtggtcccaa  tgctcagcgc  ttaaaaaaac  aaattggaca  gctacttctg
2701  ggaaaaacaa  catcattcca  aaaagaacaa  taatgagagc  aaatgcaaaa  ataaccaagt
2761  cctccgaagg  catctcacgg  aaccgtagac  taggaagtac  gagccccaca  gagccgaag
2821  ccgatgtgac  tgcacatcat  atttaacaat  gacaagatgt  tccggcgttt  atttctgcgt
2881  tgggttttcc  cttgccttat  gggctgaagt  gttctctaga  atccagcagg  tcacactggg
2941  ggcttcagg  gacgatttag  ctgtggctcc  ctctcctgt  cctccccgc  acccctccc
3001  ttctgggaaa  caagaagagt  aaacaggaaa  cctacttttt  atgtgctatg  caaaatagac
3061  atctttaaca  tagtcctggt  actatggtaa  cactttgctt  tctgaattgg  aagggaaaaa
3121  aatgtagcg  acagcatttt  aaggttctca  gacctccagt  gagtacctgc  aaaaatgagt
3181  tgtcacagaa  attatgatcc  tctatttctc  gaacctggaa  atgatgttgg  tccaaagtgc
3241  gtgtgtgtat  gtgtgagtgg  gtgcgtggta  tacatgtgta  catatatgta  taatatatat

```

Fig. 64(b)

```

3301 ctacaatata tattatatat atctatatca tatttctgtg gaggggttgcc atggtaacca
3361 gccacagtac atatgtaatt ctttccatca ccccaacctc tcctttctgt gcattcatgc
3421 aagagtttct tgtaagccat cagaagttac ttttaggatg ggggagaggg gcgagaaggg
3481 gaaaaatggg aaatagtctg attttaatga aatcaaagt atgtatcatc agttggctac
3541 gttttgggtc tatgctaaac tgtgaaaaat cagatgaatt gataaaagag ttccctgcaa
3601 ccaattgaaa agtggtctgt gcgtctgttt tgtgtctggt gcagaatatg acaatctacc
3661 aactgtccct ttgtttgaag ttggtttagc tttggaaagt tactgtaaat gccttgcttg
3721 tatgatcgtc cctggtcacc cgactttgga atttgcacca tcatgtttca gtgaagatgc
3781 tgtaaatagg ttcagatttt actgtctatg gatttggggt gttacagtag ccttattcac
3841 ctttttaata aaaatacaca tgaaaacaag aaagaaatgg cttttcttac ccagattgtg
3901 tacatagagc aatgttgggt ttttataaag tctaagcaag atgttttgta taaaatctga
3961 attttgcaat gtatttagct acagcttggt taacggcagt gtcattcccc tttgcactgt
4021 aatgagggaa aaatgggtata aaaggttgcc aaattgctgc atatttgctgc cgtaattatg
4081 taccatgaat atttatttaa aatttcggtg tccaatttgt aagtaacaca gtattatgcc
4141 tgagttataa atattttttt ctttctttgt tttattttta tagcctgtca taggttttaa
4201 atctgcttta gtttcacatt gcagttagcc ccagaaaatg aaatccgtga agtcacattc
4261 cacatctgtt tcaaactgaa tttgttctta aaaaaataaa atattttttt cctatggaaa
4321 aaaaaaaaaa aaaaa

```

FIGURE 65. EphB4 Precursor Protein

```

1 melrvllcwa slaaaaleetl lntkletadl kwvtfpqvdg qweelsglde eqhsvrtyev
61 cdvqrapgga hwlrtgwvpr rgavhvyatl rftmleclsl pragrsket ftvfyyesda
121 dtatalt paw menpyikvdt vaaehltrkr pgaeatgkvn vktlrlgpls kagfylafqd
181 qgacmallsl hl fykkcaql tvnltrfpet vprelvvpva gscvvdavpa pgpspslycr
241 edggwaeqpv tgcscapgfe aaegntkcra caqgtfkpls gegscqpcpa nshsntigsa
301 vcqcrvygfr artdprgapc ttpsaprsv vsrlngsslh lewsaplesg gredltyalr
361 crecrpggsc apcggdltfd pgprdlvepw vvvrqlrpdf tytfvtaIn gvsslatgpv
421 pfepvnttd revppavsdI rvtrsspssI slawavprap sgavldyevk yhekgaegps
481 svrflktsen raelrglkrg asylvqvrar seagygpfgq ehhsqtqlde segwreqlal
541 iagtavvgvv lylvvivvav lclrkqsngr eaeySDKhgq ylighgtkvy idpftyedpn
601 eavrefakei dsvyvkIeev igagefgevc rgrlkapgkk escvaiktlk ggyterqrre
661 flseasingq fehpnIirle gvttnsmpvm iltefmenga ldsflrlndg qftviqlvgm
721 lrgiasgmry laemsvvhrd laarnilvns nlvckvsdfg lsrflenss dptytsslgg
781 kIpirwtape aiafrkftsa sdawsygIvm wevmsfgerp ywdmsnqdvi naieqdyrlp
841 pppdcptslh qlmldcwqkd rnarprfpqv vsaldkmIrn paslkIvare nggashplld
901 qrqphysafg svgevlraik mgryeesfaa agfgsfelvs qisaedllri gvtlaghqkk
961 ilasvqhmkS qakpgtpggt ggpapqy

```

FIGURE 66. EphrinB2

```
1 mavrrdsvwk ycwgvmlvlc rtaisksivl epiywssns kflpggglvl ypqigdkldi
61 icpkvdsktv ggyeyykvym vdkdqadrct ikkentplln cakpdqdikf tikfgefspn
121 lwglefqknk dyyiistsng slegldnqeg gvcqtramki lmkvgqdass agstrnkdp
181 rrpeleagtn grssttspfv kpnpgsstg nsaghsgnni lgsevalfag iasgciifiv
241 iiitlvlll kyrrrhkhs pqhtttlsls tlatpkrgsn nngsepsdii iplrtadsvf
301 cphyekvsd yghpvyivqe mppqspaniy ykv
```

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